ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

No. 10.] [1908.

LIV.—CASCARA SAGRADA.

(*Rhamnus Purshiana*, DC.).

The drug, Cascara Sagrada, is furnished by the bark of two species of *Rhamnus*, *R. Purshiana*, DC. and *R. californica*, Eschsch., natives of Western North America.

Specimens of both species have been in cultivation in the Royal Botanic Gardens, Kew, for many years, and those of *R. Purshiana*, now form bushy trees of about 18–21 feet in height with a clean trunk of 4–5 feet in length. The specimens of *R. californica*, at Kew are bushes, and would not be likely to furnish a great quantity of bark. Cascara Sagrada was introduced into medicine some thirty years ago, and since that time there has been a rapid destruction of the wild source of supply.

The attention of Kew was drawn to the matter in a letter from Mr. F. R. S. Balfour, who has recently made some interesting journeys in the Western States of N. America with the object of studying the forests of those regions. In sending some seeds of *Rhamnus Purshiana* he wrote as follows :—

"I send you some seed of *Rhamnus Purshiana* gathered by me at the head waters of South Fork of Skokomish river, Olympic Mountains, Washington. It is from this tree that the medical 'Cascara Sagrada' (bark) is got, of which about 50 carloads were sent East from Washington and Oregon last year, proceeds of which amounted to $100,000. The trees are becoming rapidly exterminated except in remote places, and it occurs to me that an industry might be established in Western Ireland and Scotland for the growth here of the tree, which ought to flourish. I found it up to 40 feet high.

"Should you next year wish more seed, kindly let me know. I could without great difficulty get a large supply."

From the way in which *R. Purshiana* has flourished at Kew (*see* Plate 1) it seems not unlikely that it may be a suitable

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subject for introduction to the western coasts of the British Islands, and may also prove to be of value commercially since the local supply is becoming exhausted and plantations do not appear to have been started in America.

In order to test whether the bark of an English-grown tree would yield the drug in the same percentage and of as good a quality as that of the native samples, one of the Kew trees of about the size of the one shown in the plate was cut down for purposes of analysis.

Messrs. Burroughs, Wellcome & Co. very kindly undertook to examine the bark and to report the results of their investigation, and 5¾ lbs. of dry bark, the produce of the Kew tree, was sent in February last to Dr. H. A. D. Jowett, senior chemist of the Wellcome Research Laboratories, London, for analysis.

The bark sent was duly worked up into tabloids—some of which are now in Museum No. I—and it has been reported that "the present extract is undistinguishable in its action from that made from American Bark," and in a further letter from Messrs. Burroughs, Wellcome & Co., it is stated that "The physician, to whom your special Cascara was submitted, reported it to be equal to the average of tabloid products from bark grown in America."

Chemistry.

With regard to the chemistry of the drug Cascara, our knowledge is still somewhat confused and unsatisfactory. The history of the subject has been ably dealt with by Dr. Jowett, who has also done a great deal of work in attempting to discover the active principle of the drug. The following account has been extracted from the paper to which reference has been made.

The only definite principle which has been certainly isolated from Cascara bark is emodin, and in addition a small amount of a substance isomeric with emodin, melting at 183° C., but insoluble in ammonia. Glucose has also been found, and a substance which, on treatment with acids, yields syringic acid.

The bark contains about 2 per cent. of a fat yielding the alcohol rhamnol, which is identical with the alcohol obtained from Kô-sam seeds (*Brucea sumatrana*, Roxb.).

All attempts to obtain the bitter principle, an unpleasant and characteristic feature of Cascara bark, or derivates of it in a crystalline form were unsuccessful.

No difference could be observed between the chemical characters of the fresh (1 year old) or of the so-called mature bark (3 years old).

Beyond slight differences in the amounts of extractive, &c., the examination of *Rahmnus Purshiana* and of *R. californica* gave identical results.

Physiological experiments which were made for the purpose of locating the active principle of the drug, showed that emodin is not the active principle and exerts very little influence, if any, on the characteristic action of Cascara. The active principle or principles producing the aperient action of the drug are contained in that

CASCARA SAGRADA TREE IN SUMMER.
Rhamnus Purshiana, DC.

FIG. 1. *Rhamnus Purshiana*, DC., in late Autumn.
FIG. 2. *R. Purshiana*, shewing shoots from the stool.

portion of the alcoholic extract which is soluble in water and precipitated by lead sub-acetate, and further, it is contained in that portion of the regenerated lead sub-acetate precipitate which is soluble in ethyl acetate. It has not been found possible to isolate a crystalline product from this extract, and therefore no clue has as yet been obtained as to the chemical nature of the active principle.*

The Tree.

The native home of *R. Purshiana* is on the Pacific slope of North America from Northern California northwards to Oregon and Washington; it is also found sparingly in Idaho and Montana. It is stated to vary considerably in size, in some places forming a shrub of 10–12 feet in height and in others it becomes a small tree 20–40 feet high with a trunk 1 foot or more in diameter.†

The average yield of a tree is about 10 lbs. of bark, and as 1,000,000 lbs. of the drug are required annually, some 100,000 trees have to be destroyed each year; a shortage of bark was reported in 1905.‡

The following note, which has been prepared by the Assistant Curator, gives an account of the trees of *R. Purshiana* in the Royal Botanic Gardens, Kew, one of which is shewn in summer and in winter condition in the accompanying plates.

The trees of *Rhamnus Purshiana* which are now growing in the Arboretum at Kew were raised from seed sent by Mr. Luther Burbank in December, 1891. The seeds, which had been collected in Sonoma Co., California, were sown on the 5th of that month and germinated at the beginning of the following March. The largest tree is now 21 feet high, 18 feet in the spread of its branches, and the trunk girths 24 inches. It should be mentioned that they are growing in the ordinary soil of Kew which is shallow and of a dry, sandy nature. Planted in a richer deeper soil, the trees would no doubt have been considerably larger. They usually form low spreading specimens each with a short trunk and a dense head of branches. (The tree shown in the Plates has been stem-pruned, and shows a more upright habit.) The bark is rather distinct and pretty by reason of the numerous short light-coloured fissures that traverse it longitudinally.

The species is undoubtedly quite hardy at Kew. All our trees passed through the great frosts of February, 1895, unprotected and without injury, and they are not likely to experience a severer test than that. They flower regularly in May, but the fruits, which are ripe in August, are not produced regularly or in any quantity. The fertility of home-grown seeds has not yet been tested, but seeds recently imported from the United States have germinated badly.

Of the seeds sent by Mr. F. R. S. Balfour only three germinated and all the rest appear to have been bad at the time of sowing.

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* Chemical investigation of Cascara Bark by H. A. D. Jowett. D. Sc. Paper No. 47. The Wellcome Chemical Research Laboratories.

† Report of the Commissioner of Agriculture, Washington, 1885, pp. 67, 68, and Plate III., *Rhamnus Purshiana.*

‡ Pharm. Journ. 1905, p. 323.

The three plants raised from seed, sown in January last, are now from 3–5 inches in height. A further consignment of seed was received from America and distributed to various private gardens in the West of Ireland and Scotland, but unfortunately nearly the whole of this consignment of seed appears to have been infertile.

The plant can probably be propagated by means of cuttings.

Plantations of *R. Purshiana* could apparently be treated as coppice. One of the Kew trees, now 17 years old, whose bark has been analysed, was sawn off at the ground level last spring and has sent up a crowd of shoots from the stump, some of which grew 4 feet high during the summer; they are shown in the inset to Plate 2.

Rhamus californica is represented at Kew by three distinct forms, viz. the type, var. *tomentella* with very tomentose young wood and leaves, and var. *oleifolia* with smaller leaves than either of the preceding. They are all distinct-looking evergreen shrubs and evidently quite hardy at Kew. They are of purely bushy habit, being considerably more in width than they are in height, and the largest is now about 6 feet high. *R. californica*, though it yields the drug Cascara Sagrada and flourishes in Kew, does not appear to be so suitable a subject for cultivation in Great Britain.

With regard to *R. Purshiana*, however, the evidence which has been given both from the clinical and cultural points of view seems to indicate that the cultivation of this species is worthy of consideration*; moreover, it seems likely that the demand for the drug will not diminish.

Explanation of Plates.

Plate 1. A tree of *Rhamnus Purshiana*, DC. 17 years old, grown from seed at Kew. From a photograph taken in summer of a tree 21 feet in height.

Plate 2. Fig. 1. The same tree in late autumn.

Fig. 2. A vigorous growth of shoots, which have have sprung from the stool of the tree cut down for analysis. The longest shoots are 4 feet in height.

LV.—DIAGNOSES AFRICANAE: XXVI.

981. **Muraltia parvifolia**, *N. E. Brown* [Polygalaceae]; affinis *M. rigidae*, E. Mey., ramis suberectis junioribus angulatis et floribus majoribus facile distinguitur.

Fruticulus parvus, compacte ramosus, floribus exceptis omnino glaber, subrigidus. *Rami* et ramuli suberecti, subconferti, primum conspicue angulati, demum subteretes. *Folia* alterna,

* With regard to the market value of Cascara bark, it is reported in the *Chemist and Druggist* of December 5th, 1908, that fifty bags of good, thin bark, imported in 1906, were sold at the rate of 37/6 per cwt. The price, however, has been as low as 26/- and as high as 50/- per cwt,

erecta vel subadpressa, 2·5–5 mm. longa, 1–1·5 mm. lata, oblonga vel subobovato-oblonga, acuta vel mucronata, basi in petiolum brevissimum angustata, crassa, dorso bisulcata. *Flores* axillares, solitarii vel binis, pedicellati. *Pedicelli* 1·5 mm. longi. *Sepala* valde inaequalia; breviora 1–1·5 mm. longa; longiora 2 mm. longa, oblonga vel ovato-oblonga, obtusa, carinata, ciliata. *Petala* subaequalia, 4·5 mm. longa; 2 superiora linearia, obtusa, basi parce ciliata et intra parce pubescentia, alba; carina latissime biloba, alba crista purpurea.

South Africa. Worcester Div.; Karoo near Matjesfontein, Aug. 1905, *F. E. Weiss*, 2.

982. **Fagonia socotrana**, *Schweinf. in Bull. Herb. Boiss.* sér i. vii. 272 (1899) [Zygophyllaceae].

Var. **somalica**, *Sprague*; a typo sepalis minoribus pro rata latioribus, petalis brevius unguiculatis apice retusis muticis.

Pedicelli 4–5 mm. longi. *Sepala* ovato-elliptica, 3–3·5 mm. longa, 1·5–2 mm. lata, non ciliolata, alia breviter acute acuminata, alia acuta tantum. *Petala* obovata, leviter retusa, mutica, 5·5–6 mm. longa, 3·5–4 mm. lata, ungue vix 1·5 mm. longo.

British Somaliland. *Drake-Brockman*, 511, 514.

The sepals of typical *F. socotrana* are glandular-ciliolate, and the petals are conspicuously apiculate.

983. **Dichapetalum rhodesicum**, *Sprague et Hutchinson* [Dichapetalaceae]; affinis *D. argenteo*, Engl., a quo petiolis longioribus, foliis supra densiuscule pubescentibus, cymis laxioribus pro rata pauciflоris recedit.

Frutex 60–70 cm. altus, ligno molli. *Ramuli* subteretes, sulcati, circiter 3 mm. diametro, ut petioli, stipulae et inflorescentia dense fulvo-tomentosi, internodiis 1·5–3 cm. longis. *Folia* oblongo-elliptica, oblongo-ovata vel oblongo-lanceolata, acute acuminata vel rotundata et mucronata, 5–10 cm. longa, 3–4 cm. lata, basi rotundata, discolora, supra viridi-brunnea, densiuscule pubescentia, subtus dense pallide griseo-viridi-tomentosa, marginibus leviter irregulariter undulatis, nervis lateralibus utrinque 5–7 supra leviter impressis subtus prominentibus, venulis supra inconspicuis subtus prominulis; petioli 3–4 mm. longi, plano-convexi. *Stipulae* subulato-lineares, 5–7 mm. longae, subacutae. *Cymae* axillares, laxiflorae, usque ad 3 cm. longae, bracteis linearibus 2 mm. longis. *Calycis* tubus 1 mm. longus; lobi obovato-oblongi, acuti, 5–6 mm. longi, 1·5–2 mm. lati, extra fulvo-tomentosi, intra pubescentes. *Petala* oblongo-obovata, alte bifida, 5 mm. longa, 2·5 mm. lata, extra longe pilosa, intra glabra. *Stamina* 4 mm. longa, filamentis planis, antheris in semicirculum arcuatis sursum spectantibus. *Ovarium* omnino superum, ovoideum, 3-loculare, rarius 2-loculare, extra dense villosum, loculis biovulatis; stylus 3·5–4·5 mm. longus, glaber, breviter 3-fidus, rarius 2-fidus. *Fructus* (an immaturus) ovoideo-globosus, 5 mm. longus, 4 mm. diametro, dense tomentosus.

Rhodesia. Gwaii Forest, *C. E. F. Allen*, 234.

984. **Harpullia (Majidea) Fosteri**, *Sprague* [Sapindaceae—Harpullieae]; affinis *H. zanguebaricae*, Radlk., a qua floribus actinomorphis disco pentagono differt.

Folia 15–30 cm. longa; foliola 3–7-juga, opposita vel subopposita, oblonga vel lanceolato-oblonga, apice breviter obtuse acuminata, basi oblique cuneata petiolulis brevissimis, 5–9 cm. longa, 2–3 cm. lata, praeter nervum medium supra puberulum glabra. *Inflorescentia* circiter 13 cm. longa, subcorymbosa, ramis et ramulis ut pedicellis bracteis sepalis capsulisque velutino-pubescentibus. *Flores* monoici, in cincinnos dispositi quorum flos terminalis femineus ceteri masculi; bracteae ovatae, usque ad 1 cm. longae; pedicelli 6 mm. longi. *Sepala* 5, rarius 6, deltoideo-ovata, 3-3·5 mm. longa, 2·5–3 mm. lata. *Petala* nulla vel 1–2, lanceolata, utrinque dense pubescentia, usque ad 4·5 mm. longa, 1·5 mm. lata. ♂: *Discus* carnosus, pentagonus, 4 mm. diametro, intus crenulatus. *Stamina* 8, in crenulis disci inserta; filamenta subulata, 5 mm. longa. *Ovarii* rudimentum 1 mm. longum, pilosum. ♀: *Staminodia* 1·5 mm. longa. *Capsula* immatura, ultra 1 cm. longa, stylo persistente 3 mm. longo. *Semina* pilosa.

LAGOS. Oloke Meji, *Foster*, 49.

H. Fosteri is known at Oloke Meji under the native name "Ishin Oko." Though obviously allied to *H. zanguebarica*, it could not be placed in any of the subgenera of *Harpullia* as defined by Radlkofer in Engler & Prantl, Pflanzenfamilien, vol. iii. 5. p. 362. A specimen was accordingly submitted to Prof. Radlkofer, who agreed that its closest affinity was with *H. zanguebarica* and *H. madagascariensis*, and suggested that it should be placed in the subgenus *Majidea*, as the type of a new section. This involves alteration of the characters of the subgenus *Majidea*, which now differs from *Euharpullia* and *Otonychium* only in the hairy seed.

Subgenus **Majidea**, *Radlk.*, emend.

Flores actinomorphi vel zygomorphi bracteis foliaceis. Semina exarillata, pilosa.

Sectio **Goniodiscus**, *Sprague* (sect. nov.). Flores actinomorphi disco pentagono. Sp. 1, *H. Fosteri*, Sprague.

Sectio **Harpulliopsis**, *Radlk.* (sect. nov.). Flores zygomorphi disco unilaterali.

—— *Cossignia* sect. *Harpulliopsis*, Baill. in Adansonia, vol. xi. 1874, p 248; Hist. Pl. vol. v. 1874, p. 422.

Spp. 2, *H. zanguebarica*, Radlk., et *H. madagascariensis*, Radlk.

985. **Crassula Weissii**, *N. E. Brown* [Crassulaceae]; affinis *C. flabellifoliae*, Harv., sed multo minora, foliis subintegris vel obscure crenatis, floribus minoribus viridi-albis et pedicellis brevioribus differt.

Herba parva, tuberosa, 4–6 cm. alta, omnino glabra. *Tuber* 3–5 mm. diam. *Caulis* infra folia 1–1·2 cm. longus. *Folia* dua, opposita, sessilia, tenuiter carnosa, 1·4–1·8 cm. longa, 2–2·5 cm. lata, transverse subelliptica, basi latissime cuneata, integra vel obscure crenata. *Panicula* e basi ramosa, ad medium bracteis 2 oppositis rotundatis (foliis reductis) 3–5 mm. diam. et superne bracteis alternis minutis anguste oblanceolatis obtusis instructa. *Flores* subconferta. *Pedicelli* 1–2 mm. longi. *Sepala* ·75 mm.

longa, ovata, obtusa. *Petala* 2 mm. longa, 1 mm. lata, lanceolato-oblonga, acuta, virescente-alba. *Squamae hypogynae* anguste cuneatae, truncatae.

SOUTH AFRICA. Worcester Div.; Karoo at Matjesfontein, Aug. 1905, *F. E. Weiss*, 14.

986. **Kalanchöe latisepala**, *N. E. Brown* [Crassulaceae]; affinis *K. Dyeri*, N. E. Br., sed foliis sessilibus et floribus fere duplo minoribus facile distinguitur.

Herba succulenta erecta, 60 cm. alta. *Caulis* 1·3–1·5 cm. crassus, inferne glaber, superne (parte florifera) glanduloso-pubescens. *Folia* sessilia, usque ad 11–12 cm. longa et 8–9 cm. lata, obovata, apice obtuse rotundata, basi cuneata; inferiora irregulariter crenata vel subcrenato-dentata, plana, glabra, viridia; superiora (secundum pedunculum? vel partem floriferam) supra convexa, subtus concava, glanduloso-pubescentia. *Cymae* terminales, pluriflores, glanduloso-pubescentes, ramis 4–8 mm. longis. *Bracteae* parvae, elliptico-oblongae, apiculatae vel acutae. *Pedicelli* 5–10 mm. longi. *Calycis* tubus 4–5 mm. longus, lobi 7–10 mm. longi, 6 mm. lati, oblongi vel ovato-oblongi, acuti, virides. *Corolla* alba, extra glanduloso-pubescens; tubus 3–3·3 cm. longus, 4-angularis, basi leviter inflatus; lobi 4, patentes 1·2 cm. longi, 8–9 mm. lati, ovati vel elliptico-ovati, acuti, apiculati. *Stamina* superiora breviter exserta; antherae luteae. *Glandulae hypogynae* 6–7 mm. longae, lineares. *Carpella* 1·2–1·3 cm, longa; styli 2 cm. longi, exserti.

TROPICAL AFRICA. Nyasaland; raised from seed sent by *Mr. J. McClounie* to Kew in 1905, flowered in March, 1907.

987. **Felicia pusilla**, *N. E. Brown* [Compositae—Asteroideae]; proxima *F. tenera*, N. E. Br. (*Aster tener*, Harv.) omnino minora, capitulis duplo minoribus, ligulis involucro brevissime excedentibus differt.

Herba annua, 7–8 cm. alta, pauce ramosa, tenuiter pilosa. *Caulis* tenuis, internodiis 1–1·8 cm. longis. *Folia* opposita, 1·5–3 cm. longa, 2–5 mm. lata, spathulato-lanceolata, acuta vel obtusa, basi in petiolum longe attenuata. *Pedunculi* terminales, 1·5–3·5 cm. longi, graciles. *Capitula* 5 mm. diam., radiata. *Involucri* squamae subbiseriatae, aequales, 4 mm. longae, 1 mm. latae, lanceolatae, acutae, dorso parce pilosae. *Flores* omnes fertiles et pappo instructi; corolla radii ligulata, 3 mm. longa, apice recurva, coerulea, involucrum brevissime excedens; corolla disci 2·5 mm. longa, tubulosa, 5 dentata, lutea. *Achaenia* adpresse-pubescentia. *Pappi* setae scabridae.

SOUTH AFRICA. Worcester Div.; Karoo at Matjesfontein, Aug. 1905, *F. E. Weiss*, 15.

Well distinguished from all other species by its small size and the very short dark blue rays.

988. **Cyphia longifolia**, *N. E. Brown* [Campanulaceae]; affinis *C. persicifoliae*, Presl, foliis longioribus et floribus puberulis facile distinguitur.

Herba, 3·4–8·7 dm. alta. *Caulis* simplex, inferne glaber, superne puberulus ad inflorescentiam subtomentosus. *Folia* suberecta, sessilia, 5·5–13 cm. longa, 2–10 mm. lata, linearia, acuta, minute

denticulata, utrinque glabra. *Racemus* terminalis. 6–18 cm. longus, multiflorus. *Flores* nutantes vel subhorizontales. *Bracteae* 2–10 mm. longae, lineares vel filiformes, ciliolatae. *Pedicelli* 2–4 (inferiores interdum 4–7) mm. longi, puberuli vel tomentosi, basi bracteolis duobus 1–2 mm. longis onusti. *Calycis* tubus cum ovarium brevissime et latissime obconicus, 5-costatus, puberulus vel tomentosus; lobi 2–4 lin. longi, e basi ·5–1 mm. lati attenuati acuti, ciliati. *Corolla* bilabiata, extra puberula, intra glabra, lilacina vel tubo alba; lobi superiores ad medios leviter connati, lineari-falcati, acuti, inferiores 9–11 mm. longi, superioribus paulo breviores. *Stamina* 5 mm. longa; filamenta dense pubescentia; antherae dorso appresse pubescentes apice barbatae. *Stigma* obtusa. *Capsula* globosa, 5–7 mm. diam., basi tantum ubi calyce adnata puberula, superne glabra.

South Africa. Griqualand East; Mount Malowe, 3000 ft., *Tyson*, 3092. Tembuland; Bazeia, 2000 ft., *Baur*, 576. Natal; Zwartkop, 4000–5000 ft., *Wylie in Herb. Wood*, 10139.

989. **Stapelia Marlothii**, *N. E. Brown* [Asclepiadaceae]; affinis *S. Asteriae*, Masson, sed corona exteriora brevissima et lobis interioribus e basi patulis distinctissima.

Caules erecti, basi decumbentes, 10–15 cm. alti, 1·3–2·5 cm. crassi, 4-angulati, pubescentes, angulis compressis. *Flores* solitarii (*Marloth*) prope basin caulorum enati. *Pedicelli* 2 cm. (vel ultra ?) longi, velutini. *Sepala* 1 cm. longa, lanceolata, acuta, velutina. *Corolla* 10 cm. diam., extra velutino-puberula, intra leviter rugosa, ad apicem loborum pilis longis simplicibus villosa; tubus brevissimus, 1·5 cm. latus, pentagonus, ad angulos sulcatus; lobi 4·5 cm. longi, basi, 1·3 cm. lati, longe attenuato-lanceolati, acutissimi. *Coronae* lobi exteriores erecti, 2·5 mm. longi, oblongi, acuti, concavi; lobi interiores bipartiti, parte exteriora alaeformi 3 mm. longa, 2–2·5 mm. lata, late oblonga, apice obtusissima vel subtruncata, obscure denticulata; parte interiora e basi patula, 5 mm. longa, dorsaliter compressa, lineari-attenuata, apice acuta vel denticulata.

Rhodesia. Matopo Hills, *Marloth*, 3414.

990. **Crabbea acaulis**, *N. E. Brown* [Acanthaceae]; affinis *C. nana*, Nees, capitulis sessilibus, bracteis spinuloso-ciliatis, et floribus duplo majoribus differt.

Herba acaulis. *Folia* 6–8, rosulata, sessilia, subcrasso-coriacea, 4–6 cm. longa, 2–4 cm. lata, elliptico-lanceolata vel elliptico-ovata, obtusa, basi cuneata, supra glabra, subtus costa et interdum nervis parce setuloso-pilosa. *Capitula* 1–2, sessilia, pluriflora. *Bracteae* exteriores usque 2·5 cm. longae, 6–8 mm. latae, oblongo-lanceolatae, spinuloso-acuminatae, marginibus spinulis 1–2 mm. longis ciliatis, costa parce pilosa. *Calyx* fere ad basin 5-partitus, lobis linearibus attenuatis, 1–1·3 mm. latis, lobo dorsali 1–1·1 cm. longo, caeteribus paulo brevioribus, pilis longis albis suberectis ciliatis. *Corollae* tubus 13 mm. longus, apice 5 mm. diam., anguste infundibuliformis, glaber; limbus subaequaliter oblique 5-lobus; lobis 4–5 mm. longis et latis, suborbiculatis, glabris, inferioribus subtus laxe pubescentibus; palato carinato. *Stamina* inclusa; antherae dorso pubescentes, apice minute apiculatae. *Stigma* orbiculato-ovata, acuta.

Transvaal. Jeppestown Ridges, near Johannesburg, 6000 ft. *Gilfillan in Herb. Galpin*, 6245.

991. **Isoglossa densa**, *N. E. Brown* [Acanthaceae]; affinis *I. origanoidi*, Lindl., bracteis multo angustioribus, linearibus vel lineari-lanceolatis, obtusis, marginibus apice involutis, nec planis nec dense villoso-glanduliferis, facile distinguitur.

Caules erecti, ramosi, inferne glabri, superne puberuli. *Folia* superiora (cum petiolis 2–4 mm. longis) 1·5–3 cm. longa, 7–14 mm. lata, subrhomboideo-ovata, breviter et obtuse acuminata, basi cuneata, supra glabra, subtus venis parce scabro-puberula, basi tantum ciliata. *Spicae* ad ramos terminales, 2–3 cm. longae, 1 cm. latae, densae. *Bracteae* inferiores foliis parvis simulantes, ceteres 6–10 mm. longae, 2 mm. latae, lineares vel lineari-lanceolatae, obtusae, marginibus superne involutae, cum bracteolis sepalisque pilis simplicibus ciliatae, dorso pilis glanduliferis laxe vel subdense obtectae. *Bracteolae* 6–7 mm. longae, 2 mm. latae, lineari-lanceolatae, acuminatae. *Sepala* 6–7 mm. longa, 1–1·5 mm. lata, lineari-lanceolata, acuminata. *Corolla* glabra, apice labiis tantum puberula, alba; tubus 4–5 mm. longus, calyce brevior; labia aequilonga, 6 mm. longa; labium superius oblongum, breviter et obtuse bifidum; labium inferius brevissime et obtusissime 3-lobum, palato profunde sulcato. *Stamina* 2, glabra; antherae loculi superpositi. *Capsula* glabra, basi stipitiformis, 1–2-sperma.

South Africa. East London Div.; near East London, *Wood in Herb. Galpin*, 3375.

992. **Vitex Fosteri**, *C. H. Wright* [Verbenaceae-Viticeae]; a *V. ferruginea*, Schumach. & Thonn., foliolis ellipticis petiolulis longioribus differt.

Rami quadrangulares, fulvo-villosi. *Folia* 5–7-foliolata; foliola elliptica, basi cuneata, apice breviter cuspidata, 8 cm. longa, 4 cm. lata, supra sparse puberula, subtus ad venis pubescentia, ad laminis minute denseque aureo-glandulosa, integra vel obtuse serrata; petiolus 8 cm. longus, fulvo-villosus; petioluli tenues, 1–2 cm. longi. *Calyx* aperte campanulatus, 7 mm. diam., extus dense villosus; tubus 4 mm. longus, ore subobliquus; lobi triangulares, 2 mm. longi. *Corollae* tubus 8 mm. longus, curvatus, medio constrictus, extus basi glaber, supra puberula, intus basi glaber, nitida, supra staminum insertionem pubescens; lobi patentes, ovati, 4 mm. lati; lobus anticus rotundatus, crenatus, 8 mm. diam. *Filamenta* robusta, pubescentia; antherae divergentes. *Stylus* glaberrimus.

Lagos. *Foster*, 34.

993. **Plectranthus Alleni**, *C. H. Wright* [Labiatae-Ocimoideae]; *P. stenophyllo*, Baker, affinis, calycis dentibus majoribus foliisque petiolatis subtus glabris differt.

Caulis erectus, rigidus, glaber, ad 16 cm. altus, 2 mm. latus. *Folia* oblonga, obtusa, basi longe attenuata, obscure crenata, utrinque glabra, subtus glandulis minutis impressis instructa, ad 10 cm. longa et 2·5 cm. lata; petiolus 1·5–3 cm. longus. *Racemus* terminalis, laxiflorus; pedunculus infra glaber, supra hirsuta;

pedicelli 4 lin. longi. *Calyx* hirsutus ; tubus campanulatus, 2 lin. longus ; lobus posticus ovatus, 2 mm. longus ; lobi caeteri e basi deltoideo rigide subulati. *Corolla* extus hirsuta, intus glabra ; tubus 4 lin. longus, leviter curvatus ; lobus anticus ovatus, concavus, 5 lin. longus, 3 lin. latus, obtusus ; lobi caeteri oblongi, 3–4 lin. longi. Filamenta glabra.

Rhodesia. Lukandu River, *C. E. F. Allen*, 471.

994. **Aristogeitonia**, *Prain*, gen. nov. [Euphorbiaceae] ; genus inter Phyllantheis ponendum, a generibus alteris quorum folia digitatim foliolata sunt calycis utriusque sexus segmentis 2-serialibus, florumque fasciculis ad axillas foliorum delapsorum glomeratis recedens.

Flores monoici, apetali. *Flores* ♂ : *Sepala* 6, 2-serialia, imbricata. *Discus* 0. *Stamina* 14–15, filamentis liberis ; antherae ovatae, loculis parallelis longitudinaliter dehiscentibus. *Ovarii rudimentum* insigne, 3-lobum. *Flores* ♀ : *Sepala* 6, 2-serialia, imbricata. *Discus* annularis, crenato-lobatus. *Ovarium* 3-loculare ; styli breves, patentes, plani, crassiusculi, obcordati, basi brevissime connati ; ovula in quoque loculo gemina. *Capsula* in coccos 3 2-valves dissiliens, endocarpio duriusculo crustaceo. *Semina* in coccis abortu saepissime solitaria, ovata ; testa crustacea, nitida.— *Arbor*. *Folia* alterna, 1-foliolata vel digitatim 2–3-foliolata, distincte petiolata ; foliola sessilia, integerrima, coriacea, penninervia ; stipulae distinctae, subulatae. *Flores* fasciculati ad axillas foliorum delapsorum glomerati.

A. limoniifolia, *Prain* (species unica).

Arbor, innovationibus parcissime puberulis. *Folia* petiolata petiolis puberulis valde inaequalibus ·5–4·5 cm. longis, nunc 1-foliolata nunc 2–3-foliolata foliolis glabris coriaceis, in eodem folio saepe inaequalibus ovato-lanceolatis acutis basi cuneatis margine integerrimis, 3–8 cm. longis, 1·25–3·5 cm. latis, nervo mediano distincto praesertim subtus, nervis secundariis 8–12-jugis subtus gracilibus supra vix manifestis ; stipulae subulatae, 6 mm. longae. *Perianthii segmenta* ♂ triangularia, acuta ; ♀ ovata, breviter acuminata, extra puberula, glomeruli floresque parvuli. *Capsula* 1·25 cm. longa lataque. *Semina* 8 mm. longa, 5 mm. lata.

Tropical Africa. Lower Guinea; Angola, Loanda Dist., *Gossweiler*, 457 !

995. **Androstachys**, *Prain*, gen. nov. [Euphorbiaceae] ; genus inter Phyllantheis ponendum, nulli tamen adhuc descripto arcte affine floribusque masculis pro ordine inusitatis insigne.

Flores dioici, apetali. *Discus* 0. *Flores* ♂ : *Perianthium* e segmentis 2–5 bracteiformibus liberis compositum. *Stamina* plurima secus axin elongatum spiraliter disposita, filamentis imis distinctis perbrevibus recurvis, caeteris obsoletis ; antherae elongatae axi plus minusve approximatae, loculis distinctis connectivo adnatis longitudinaliter dehiscentibus. *Ovarii* rudimentum 0. *Flores* ♀ : *Perianthium* 5-partitum, lobis ovatis acuminatis imbricatis. *Ovarium* 3-loculare, sericeo-pilosum, stylis in columnam elongatam sericeo-pilosam connatis, stigmatibus 3 reflexis ; ovula in quoque loculo gemina. *Capsula* 3-dyma septicide in coccos demum

2-valves dissiliens, endocarpio crustaceo. *Semina* ovata, compressa; albumen carnosum; cotyledones planae, radicula multo latiores.—*Arbor* erecta, alta; ramuli plus minusve adpresse sericeo-pilosi, angulati, ad nodos articulati. *Folia* decussatim opposita, coriacea, petiolata; stipulae magnae, coriaceae, intrapetiolares simulac interpetiolares, folia juniora et flores in alabastro obtegentes, primum inter folia sejunctae demum omnino deciduae. *Flores* axillares, pedunculati, pedunculis sericeo-pilosis; ♂ in axillis singulis 3-ni, pedunculis nunc basi nunc fere omino coalitis, lateralibus centrali parum minoribus; pedunculi versus apicem petalis bracteiformibus extra hirsutis saepe bilobis spiraliter dispositis induti; perianthii segmenta in pedunculo centrali saepe 5 in pedunculis lateralibus 2–3 axin staminiferum plus minusve hirsutum obtegentia; ♀ in axillis singulis solitarii.

A. Johnsonii, *Prain* (species unica).

Arbor alta. *Folia* ovata, obtusa, margine integra, basi rotundata vel subcordata, supra glabra, subtus saepissime molliter sericeo-pilosa, 3–5 cm. longa, 2·5–4 cm. lata; stipulae 1·5 cm. longae, extra sericeo-pilosae; petioli 1 cm. longi, sericeo-pilosi. *Flores* lutei, pedunculis 1 cm. longis; ♂ axibus staminiferis 1·5–2·5 cm. longis; ♀ calyce 6 mm., stylo 6 mm. longis. *Capsula* depressa, 1·25 cm. longa, 1·5 cm. lata, endocarpio crustaceo. *Semina* 8 mm. longa, 6 mm. lata, 3 mm. crassa; testa brunnea, nitida.

Tropical Africa. Mozambique Dist.; Mosembe, *O'Neill*! Beira, *Johnson*, 283!

O'Neill gives the native name as 'Makrouss'; Johnson gives it as 'Zimbiti.' Both collectors state that the timber is valuable.

996. **Pycnocoma angustifolia**, *Prain* [Euphorbiaceae-Crotoneae]; species *P. Thonneri*, *P. Zenkeri* et *P. trilobatae* accedens; differt tamen foliis angustioribus, bracteis glabrescentibus, stylisque pro genere altissime connatis.

Frutex ramulis lignosis. *Folia* chartacea, glaberrima, laete viridia, oblanceolata vel anguste obovato-lanceolata, reticulata, apice acuta, margine integra vel minute remote dentata, versus basin in petiolum alatum brevem attenuata; lamina 14–20 cm. longa, 4–6 cm. lata; petiolus 1–2 cm. longus. *Flores* racemosi; racemi ad ramulorum apices axillares, rhachi 10 cm. longa bracteisque ovato-lanceolatis acutis planis 6 mm. longis parce puberulis vel fere glabris. *Flores* ♂ pedicellati, pedicellis puberulis vel fere glabris 1·5 cm. longis; alabastra globosa; sepala extra fere glabra, anguste ovata, acuta; stamina plurima filamentis longe exsertis 1·5 cm. longis. *Flores* ♀ in racemis terminales; sepala extra appresse puberula, anguste lanceolata; ovarium appresse hirsutum, 3-loculare, loculis singulis cornubus 2 conicis obtusis instructis; styli 3, in columnam fere glabram 1 cm. longam connati, superne per spatium 2–3 mm. longum tantum liberi. *Fructus* non visa.

Tropical Africa. Upper Guinea; Liberia, neighbourhood of Kakatown, *Whyte*!

997. **Tragia** (**Tagira**) **Scheffleri**, *Baker* [Euphorbiaceae-Crotoneae]; species *T. augustifoliae*, Benth., affinis, foliis brevioribus latioribusque racemis densioribus bracteis augustioribus differt.

Caulis gracilis, volubilis, pubescens. *Folia* manifeste petiolata, ovata, acuta, argute serrata, basi distincte cordata, 5–7 cm. longa, 2·5–4 cm. lata, membranacea, utrinque parce hirsuta. *Racemi* densi, multiflori, axillares, breviter pedunculati; bracteae lineares; pedicelli alabastris breviores. *Alabastra* globosa, glabra, 1·25 cm. longa. *Sepala* floris foeminei 3, ambitu orbicularia, demum 7–8 mm. longa lataque, alte palmatim laciniata, laminae parte indivisa orbiculari, laciniis 12–15 lanceolatis hispidis.

Tropical Africa. Usambara, Nquelo, *Scheffler*, 47 !

998. **Gasteria Huttoniae**, *N. E. Brown* [Liliaceae-Aloineae]; affinis *G. Croucheri*, Baker, sed foliis duplo latioribus et floribus duplo brevioribus conspicue differt.

Folia laxe rosulata adscendente-patentia, 40–45 cm. longa, basi 18–30 cm. lata, superne attenuata, ad apicem acutam vel obtusam 2·5 cm. lata, oblique carinata, ad carinam 4–5 cm. crassa, marginibus cartilagineo-denticulatis, utrinque viridia maculis obscure alboviridulis zonatim variegata. *Pedunculi* laxe paniculatim ramosi, 1·36–1·5 m. alti; rami 40–90 cm. longi, racemosim multiflori. *Flores* penduli. *Bracteae* 4–18 mm. longae, membranaceae, deltoideo-subulatae vel e basi deltoideo-ovato subulato-acuminatae albidae. *Pedicelli* 3 mm. longi. *Perianthium* 2–2·2 cm. longum, curvatum, tubulosum, basi ovoideo-inflatum, 5–5·5 mm. diam., roseo-miniatum, superne cylindricum, pallide roseum, lobis viridi-carinatis. *Stamina* inclusa; antherae luteae.

Cape Colony. Stutterheim Div.; Ripplemead, near Kabousie, *Mrs. C. Hutton.*

Described from a living plant sent to Kew by Dr. Schönland in June 1906, which flowered in August 1907 and 1908.

999. **Dasystachys leptoneura**, *C. H. Wright* [Liliaceae-Asphodeleae]; a *D. nervata*, C. H. Wright, pedunculo breviore, foliis pedunculisque pubescentibus differt.

Radiculae anguste fusiformes. *Folia* oblonga, basi late vaginantia, acuta, 15 cm. longa, 10–15 mm. lata, membranacea, supra minutissime puberula, subtus ad nervos dense pubescentia, marginibus ciliatis. *Racemus* 12 cm. longus; pedunculus 3 cm. longus; bracteae scariosae, e basi late lanceolato longe cuspidatae, floribus superantes. *Perianthii* segmenta oblonga, obtusa, 4·5 mm. longa, 1·5 mm. lata, membranacea, tenuiter unicostata. *Filamenta* perianthio paullo longiora, tenues; antherae oblongo-lanceolatae, basi cordatae, 3 mm. longae, prope basin dorsifixae. *Ovarium* 1·5 mm. longum, 2 mm. in diam., viride; stylus filiformis.

British Central Africa. Nyika Plateau; Nacheri, 2380 m., *McClounie*, 89.

1000. **Sporobolus Schweinfurthii**, *Stapf* [Gramineae]; affinis *S. marginato*, Hochst. ex A. Rich., sed panicula haud divaricata, gluma superiore tenuiter acuminata, caryopsi majore elliptico-oblonga humefacta mucilaginem exudenti distincta.

Culmi subrobusti, erecti, 1 cm. alti, 4-nodi, internodiis superioribus exsertis. *Foliorum* vaginae subarctae, glabrae, laeves; ligula ad lineam ciliolatam reducta; laminae lineares, longe tenuiterque attenuatae, ad 25 cm. longae, 3·5–5 mm. latae, planae, glaucae,

supra scaberulae, infra laeves, ad margines serrulatae vel inferne fimbriatae. *Panicula* oblonga, erecta, 30 cm. longa, 4–6 cm. lata, laxiuscula ; rami primarii 10-6-ni., verticillati, oblique erecti, ad 10 cm. longi, basi excepta ramulosi, filiformes, laeves vel superne scabridi, secundarii breves, haud divaricati ; pedicelli quam spiculae breviores vel brevissimi. *Spiculae* purpurascentes, lanceolato-oblongae, 2·2–2·5 mm. longae. *Glumae* admodum inaequales, inferior hyalina, anguste oblonga vel lanceolata, subacuta, spiculam mediam paulo excedens, superior lanceolata, tenuiter acuminata, 1-nervis, valvam paulo excedens. *Valva* lanceolata, acuta vel subacuminata, 1-nervis ; palea paulo brevior. *Stamina* 3 ; antherae 1·2 mm. longae. *Caryopsis* elliptico-oblonga, 1·5 mm. longa, obtuse quadrangularis, compressa ; pericarpium rigidum, dehiscens. *Seminis* testa humefacta mucilaginosa ; endosperma opacum.

Tropical Africa. Bahr-el-Ghazal district ; Niamniam country, by the Ibba River, near Nganye, *Schweinfurth*, 3971.

LVI.—THE NELSON DISTRICT OF NEW ZEALAND.

The following letter descriptive of a journey in the Nelson District of New Zealand, by Capt. A. A. Dorrien-Smith, has been forwarded by him at the request of the Director for publication in the *Bulletin* :—

An Account of a Trip to the Nelson District of New Zealand in January, 1908.

I left Nelson on 16th January by a small steamer to Motueka, which is the centre of a considerable fruit-growing area, about two hours steam in a N.W. direction. On arrival I set off to drive 29 miles to a farmhouse occupied by Mr. Stebbings, who is in the habit of accommodating travellers and provides the necessary pack-horses, &c., for beyond his house there are no roads, mountain tracks only being available. It was after dark when I started the drive up, which was very fine, as the forest in the hills away to our right front was all ablaze, and a great cone-shaped mountain in particular was red-hot and looked like a vast volcano. This we passed some miles to our right and north and arrived in a narrow valley, which also was burning fiercely, the great trees crashing down the mountains and starting the rocks and stones at times created a terrific roar. The driver of the trap feared our way up the mountains might be impeded by the burning fallen logs, and on arrival at the farmhouse, where I found Mr. F. G. Gibbs and three others, it proved to be the case. This was a nuisance, as it meant delay. However, the next morning, having given up all hope of getting the pack-horses through, we started up the track to Mount Arthur, about seven miles, and returned the same day, leaving men to clear the track for the horses. On our return we found that the men had cleared the track, and as it turned out I think we could have got through with the horses and thus saved a long tramp. Anyway, the walk through the bush was most interesting when once we had got

clear of the burnt part. The forest hereabouts is chiefly composed of Beech, *Fagus fusca* being predominant and of enormous size. The other forest trees were *Dacrydium cupressinum* (Rima), *Podocarpus dacrydioides*, white pine, *P. spicatus* (Matai), *P. ferrugineus* (Miro), while the smaller trees were represented by *Carpodetus serratus*, *Fuchsia Colensoi*, *Hedycarya arborea*, *Aristotelia racemosa*, while on a limestone crag grew *Metrosideros lucida*. Among the smaller shrubs and underscrub I noticed *Drimys colorata*, with its beautiful green, yellow and red-coloured foliage, *Brachyglottis repanda*, and, along the streams, *Senecio Hectori*, which was in full flower and very lovely—it is one of the best of the New Zealand Senecios—while tree ferns and other ferns were fairly plentiful. At about 3000 ft. I noticed scarlet patches on the *Fagus*, and these turned out to be the scarlet-flowered mistletoe (*Loranthus*), a lovely sight, which as we got higher became more frequent and perfectly gorgeous. At about 4000 ft. the beech became smaller, and the forest became of a more scrubby nature. *Fagus Menziesii* became the predominant beech, and I met for the first time *Dracophyllum Traversii*, a magnificent tree, 15 to 20 ft. in height, with a lovely red stem and foliage like that of *Cordyline;* its branches spread upwards from the main stem in most beautiful curves like an ever-branching candelabrum, and it was in full flower.

I also saw many other plants of great interest, among them *Panax lineare*, *Olearia lacunosa*, *Senecio elaeagnifolius*, *Ourisia macrophylla*, *Phyllocladus alpinus*, *Astelia nervosa*, *Pratia angulata*, *Pentachondra pumila*, *Senecio gemminatus*, and *S. Bidwillii*. An ascent of about 500 ft. more brought us out of the forest, and immediately the Celmisias appeared, and so various were they that one did not know which one to turn to first; they were in full flower and very lovely. Here the chief varieties were *C. incana* and *C. Dallii*, and while advancing up the open slopes of the mountain different species of *Veronica*, *Aciphylla Colensoi* and *A. squarrosa* were at once apparent. The rain which had been threatening for some time now came on, and the whole mountain was enveloped in mist, so that it became advisable to retrace our steps, as a night out would have been exceedingly unpleasant, so we arrived back at the farm about 6 p.m., and my feet were not sorry to get in even if I was reluctant to leave the flowers.

We found the track had been cleared of the fallen logs, and next morning we set off at daylight with the pack-horses up the track again, passed the turning to Mount Arthur to our left, and headed for the Cobb Valley by a bridle track; on the way I got seed of *Olearia lacunosa*, and saw some fine specimens of *Todea superba*. The whole way lay through the beech forest, which was very lovely, but the tramp was rather tedious, being up and down rather violent hills all the way. At last, about 4 p.m., we came out into an open glade covered with Celmisias, and the beech trees all aglow with the scarlet-flowered mistletoe; it was a magnificent sight, and brighter by far than any *Metrosideros*. This glade led us down into the open Cobb Valley, and after going up it some three miles we came to a bushman's hut, where we stayed the night. I preferred the ground to the boards of the hut, and slept outside and very soundly. The chief plants other than those already mentioned

were *Pittosporum rigidum*, a plant more distinguished as a botanical curiosity than anything else, *Dacrydium Bidwillii*, and others; also *Hymenanthera dentata*, *Enargea marginata*, *Wahlenbergia saxicola*, and *Pimelia prostrata*.

The next day we pushed on about five miles only, and pitched our camp. The Cobb Valley is most interesting because, in the first place, it is practically unknown except to surveyors, and, with the exception of Mr. F. G. Gibbs, no botanist had been in it. It is a broad, glacial valley with a sluggish river flowing through it, instead of the violently gorged valleys and rapid rivers which are the prevalent characteristic of the country. Here was a beautiful U-shaped valley half-a-mile broad, grassed and fertile, but boggy in places; the mouth is dammed by a hard vein of quartzite, which is the cause of the original shape being maintained. There are fine examples of 'roche moutonnè' and other glacial evidences. Our camp was pitched about six miles from the head of this valley, which is dominated by Mount Cobb. The surface of the valley was in places carpeted with a fine species of *Bulbinella*, which seems quite distinct from *B. Hookeri*, as it is in every way a finer thing, but not so handsome as *B. Rossii* of the Auckland and Campbell Islands. In other places were masses of a white-flowered Gentian, which as yet is classed under *Gentiana patula*, though it differs from that species in many respects. The bush patches in the valley and their plant associations were most interesting, among them being *Aristotelia fruticosa*, *Gaya Lyallii*, *Coprosma cuneata*, *C. foetidissima*, *Pittosporum rigidum*, and generally tussocks of *Danthonia Raoulii* scattered about. I found *Veronica salicornioides* growing in this valley 7 ft. high. I got into a bush which was well over my head, but Cheeseman in his book says it attains a height of 3 ft. only. The side slopes of the valley are covered in beech forest, with much of the usual superb undergrowth missing. *Fagus Menziesii* here seemed predominant, and I was able to obtain some fine photographs of individual specimens. There also grows in this valley *Pittosporum patulum*, a very remarkable and distinct species, of which I have several plants. It occurs very rarely elsewhere in New Zealand, and practically only extends for four miles along the Cobb at the edge of the forest; from the juvenile form one would never guess its parental origin.

From our camp we made expeditions up the "walls" of the valley to the heights above, and always something interesting cropped up. For the first 1500 ft. we passed through beech forest, then came *Danthonia Raoulii* meadows and dwarfing bush with open glades, and in these *Celmisia Dallii*, *C. incana*, and *C. Traversii* were magnificent beyond description. The latter is distinguished by its shining, bright-green leaf, with purple mid-rib on the upper surface, while the under surface is covered with a soft, brown tomentum, the leaves being from 6 to 16 inches long and $1\frac{1}{2}$ to $2\frac{1}{2}$ inches broad. We caught them in their full glory, alas, rather too early for seed; but still I have a good assortment one way and another, and plants as well. In the drier places on the mountains we found *Celmisia spectabilis*, *C. laricifolia*, *C. hieracifolia*, *C. rupestris*, *C. bellidioides*, *C. Gibbsii*, and plenty of *C. coriacea*, but not so fine as in other localities.

Senecio Lyallii, var. *schorzonerioides*, was growing in great abundance on the shady, moist slopes of the mountain, and this also has a daisy flower with a yellow eye, and forms a mass of white. There are so many "daisy" flowers about that it becomes rather monotonous, as they are very much in evidence and so dwarf the significance of the rest of the mountain flora.

Whilst making an excursion up the hills opposite Mount Cobb on the East side of the valley, we came across the rare *Senecio Adamsii*, which was growing preferably among the larger stones of the shingle cliffs in great profusion. On the following day we attacked Mount Cobb itself, a fine bold mass of rock on the face of which were outlined the most weird distortions of the strata. There are patches of forest about its base composed for the most part of *Fagus* and *Dracophyllum Traversii*, and we found a peculiar stiff glaucous-leaved *Veronica*, a form of *V. elliptica*, which spends its winter apparently under the snow for it was much beaten down by pressure, and indeed we found some growing on a ledge where the snow had not melted; and close by this we discovered the most lovely *Myosotis* I have ever seen; I was first attracted by its scent and then saw it above me on a ledge of rock underlying a steep cliff where the sun would not penetrate after 10 a.m., even in summer. It proved to be *Myosotis macrantha*, var. *pulchra*, the flowers are, in the young stage, brownish-orange with a shade of green, and in the later stage lighter and more yellow. We found many other plants of great interest such as the dwarf *Dacrydium laxifolium*, *Podocarpus nivalis*, Veronicas, *Dracophyllum rosmarinifolium*, *D. Kirkii*, Geums, Craspedias and *Ranunculus Monroi*, *R. geraniifolius* and *R. insignis*.

We started to return on Saturday the 25th viâ Mount Peel and the Mount Arthur tableland; it was a glorious day, and from Mount Peel I saw Mount Tapuaenuka in the Kaikora Mountains which was close to where I had been staying for some time in the Marlborough district. As we proceeded over the tableland the scarlet mistletoe was more gorgeous than ever and after about a 23 miles tramp we arrived at the Flora-stream camping ground by sundown, having sent the pack-horses by a shorter route. We stayed there the night leaving five miles to be done the next morning back to Stebbing's farm. I obtained a fine collection of plants but almost lost the lot for, when we had proceeded nearly to the bottom of the track and arrived at where the forest was burning, we found more huge logs strewn in our path and a way had to be carved with axes out of one huge log to admit of the horses passing. The second horse, on which the plants were loaded, caught its pack in the side of the cut and was thrown with one leg over the precipice; it looked like losing horse and all, but luckily the horse remained quiet and we were able to cut the packs adrift and get the beast clear.

The other difficulties were circumvented, but not before the packs were off-loaded and transported by hand to where the track again became clear. After this no more difficulties were met with and so one of the most interesting and delightful trips I have ever made came to an end and we all arrived safely back in Nelson after ten days' absence.

LVII.—DECADES KEWENSES

Plantarum Novarum in Herbario Horti Regii Conservatarum.

DECAS LI.

501. **Berberis parvifolia**, *Sprague* [Berberidaceae]; affinis *B. dictyophyllae*, Franch., a qua omnibus partibus permulto minoribus, ramis puberulis, floribus plerumque fasciculatis, glandulis petalorum minus elongatis recedit.

Rami cinerei, puberuli. *Spinae* gracillimae, mediae circiter 1 cm. longae. *Folia* oblanceolata vel anguste obovata, 5–10 mm. longa, 2–2·75 mm. lata, spinuloso-apiculata, in basin sensim angustata, integra vel spinuloso-dentata, exsiccando brunneola crebre prominenter reticulata. *Flores* 1–4-fasciculati, pedicellis circiter 5 mm. longis. *Sepala* exteriora ovata usque elliptica, 2–2·5 mm. longa, 1·3–2 mm. lata, interiora late elliptica, 3·5 mm. longa, 2·5–3 mm. lata. *Petala* obovata, 2·75 mm. longa, 1·75 mm. lata, trinervia nervis a basi distinctis vel fere, glandulis valde discretis ellipticis circiter 0·3 mm. longis 0·4 mm. supra basin sitis. *Stamina* 2 mm. longa. *Pistillum* via 2 mm. longum, ovario paulo ultra 1 mm. longo, stylo circiter 0·3 mm. longo; ovula 4. *Bacca* ignota.

Western China. *Wilson*, 3154*a*.

502. **Boschia Mansoni**, *Gamble* [Malvaceae]; species a *B. Griffithii*, Mast., et *B. excelsa*, Korth., floribus et fructu multo majoribus et columna staminali longissima differt: prima facie ob columnam staminalem longam ad genus novum pertinere videtur sed antheris congestis unilocularibus poro unico terminali dehiscentibus et aliis notis hinc referendam arbitramur.

Arbor magna; ramuli graciles foliisque subtus calycibus et ovariis dense lepidoti; squamae stellatae, peltatae, argenteo-fuscae. *Folia* alterna, integra, elliptico-oblonga, apice abrupte longe acuminata, basi rotundata vel fere cordata, supra viridia, lucida, infra lepidota, 15–20 cm. longa, 4–6 cm. lata; costa gracilis ad apicem in mucronem brevissimum producta, nervi propter squamas densissimas perobscuri, utrinque 12–15; petiolus 1·5–2 cm. longus, supra crassus, infra gracilior. *Flores* magni, 5–7·5 cm. longi, pedunculis crassis ad ramos fasciculatis; bracteae 2, ovatae vel ovato-oblongae, ad basin connatae et calycem amplectentes, extra lepidotae, intus glabrae, 2 cm. longae, 1·5 cm. latae. *Calyx* tubuloso-campanulatus, basi ventricosus extra densissime lepidotus, intus glaber, 2 cm. longus; lobi 5, ovati, acuti, tubo aequilongi. *Petala* 5, rubra, spathulata, 3–3·5 cm. longa, 1–1·5 cm. lata, extus ad ungues parce lepidota et pubescentia, intus glabra. *Columna staminea* 3–4 cm. longa, superne in fasciculos 5 divisa, fasciculis 1–2 cm. longis. *Antherae* cylindrico-globosae, 1-loculares, poris terminalibus dehiscentes. *Ovarium* oblongum, angulatum, spinis multis squamas peltatas fimbriatas ferentibus dense tectum; stylus gracilis, pubescens, columna staminea aequilongus; stigma parvum capitatum; loculi 5, ovulis plurimis superpositis ex angulo interiori loculorum ortis erectis. *Fructus* globosus, apice

depressus, ad 5 cm. longus et 6–7 cm. diametro, spinis subulatis curvatis pubescentibus 12–13 mm. longis densissime tectus; pericarpium crassum, gummiferum. *Semina* (nondum matura) plurima, 12–13 mm. longa, hilo conspicuo, arillo magno succulento.

BURMA. At Papua, Daywin Road, Amherst, *F. B. Manson*; collected in April, 1905.

Vernacular name *Taw duyin* or "wild durian," Burm.; *Turimi*, Karen.

503. **Acer Osmastoni,** *Gamble* [Aceraceæ]; species foliis plerumque trilobis; ex parte ad *A. laevigatum*, Wall., speciem foliis indivisis, ex parte ad *A. Campbellii*, Hook. f. et Thoms., speciem foliis 5–7-lobis accedit; ab hac samaris minus divergentibus ab illa petiolis multo longioribus differt.

Arbor magna, ad 30 m. alta; ramuli teretes, glabri, rufescentes, graciles. *Folia* decidua, chartacea, opposita, juniora rufescentia, aliquando indivisa; matura in dimidio superiore 1–3-loba, basi rotundata vel paullo cordata, lobis erectis ovato-lanceolatis longe caudato-acuminatis acute serratis, 12–15 cm. longa, 6–8 cm. lata; supra glabra, infra etiam praeter nervos et floccos in axillis nervorum glabra; costae 3, ascendentes, nervis et reticulatione conspicuis; petioli graciles, 1–2 cm. longi. *Cymae* pedunculatae, in paniculam terminalem 7–10 cm. longam dispositae; pedunculi 5–10 mm. longi; bracteae minutae, subulatae; pedicelli graciles, 2–8 mm. longi. *Flores* parvi, polygami, viridescentes. *Sepala* 5, membranacea, inaequalia, ovato-acuminata, pallide flava, 5-nervia, ciliata, intus hirsuta, 2–8 mm. longa. *Petala* 5, alba, ovato-orbicularia, crenata, glabra, 1·5–2 mm. diametro. *Discus* annularis, integer vel crenatus. *Stamina* 8, intra discum inserta; filamenta gracilia, subulata; antherae oblongae, emarginatae, minute papillosae. *Ovarium* 2-loculare, sericeo-villosum; stylus gracilis; stigmata 2, recurva, torta; ovula in quoque loculo 2, pendula. *Fructus* ex samaris 2, in angulo recto divergentibus; alae rectae, apice rotundatae, basi contractae, venosae; semen in quaque samara unicum.

INDIA: in the Sikkim Himalaya at 6–7000 ft., at Darjeeling, Tonglo, Rangirún and other localities in 1904, *B. B. Osmaston;* also at Darjeeling in 1879, *Gamble*, in leaf only.

Mr. Osmaston thought this species to be probably a hybrid between *A. laevigatum* and *A. Campbellii* but its wide distribution in the district seems against this supposition, although when comparing together specimens of the three species it seems a natural one.

504. **Cynometra Bourdilloni,** *Gamble* [Leguminosae-Caesalpinieae]; ad *C. Beddomei*, Prain, et *C. inaequifoliam*, A. Gray, foliolis 3-jugis accedit, sed foliola multo minora et fructus diversus.

Arbor pulchra, ad 18 m. alta. et 45 cm. trunci diametro, cortice laevi nigro-viridi; ramuli sinuati, sparse lenticellati, fere nigri. *Folia* persistentia, alterna, paripinnata; rhachis cum petiolo 3–4 cm. longa; foliola 3-juga, opposita, sessilia, integra, ovato-spathulata, apice emarginata, basi cuneata inaequalia, supra nitida, subtus fere glauca et saepe glandulis nigris ornata, 2·5 ad 3·5 cm. longa, 0·75 ad 1·5 cm. lata; costa conspicua, basi incrassata

rugosa; nervi primarii inconspicui, utrinque 6–7, margines versus reticulatione connexi. *Flores* albi, in racemos axillares densos 1·5 ad 2 cm. longos dispositi; racemi in axillis bini, ad basin perulis multis late-ovatis paleaceis áureo-fulvis suffulti; rhachis fulvo-villosa, angulata; bracteae perulis similes; pedicelli 3–4 mm. longi; bracteolae fulvae, spathulatae. *Calyx* spathaceus, irregulariter 3–4-lobatus, ad 3 mm. longus. *Petala* 5, aequalia, oblongo-spathulata, angusta, glabra, 4 mm. longa. *Stamina* 10, 5 paullo breviora; filamenta gracilia, glabra, 6–8 mm. longa, antherarum loculis parallelibus. *Ovarium* ovoideum, densissime fulvo-villosum, sensim in stylum attenuatum; stylus superne glaber, stigmate obliquo obscure bilobo; ovula 1–2. *Legumen* reniforme indehiscens, medio aequaliter constrictum; 1·5 cm. longum, 2 cm. latum; pericarpio crasso brunneo. *Semen* unicum, magnum, legumini conforme; testa irregulariter fracta; cotyledones crassissimae, supra et infra profunde fissae, radicula conica.

South India. Banks of the Parapár river, Travancore, 150 m., *T. F. Bourdillon.*

This species may be the same as that collected on the S. Ghâts of the Nilgiris by J. S. Law in 1892, of which specimens are in the Kew Herbarium. But the leaflets of Law's specimens are bluntly acuminate at the apex and very deeply emarginate. It flowers in February and March; fruits in July and August.

505. **Cotyledon lateralis**, *N. E. Brown* [Crassulaceae]; species distinctissima, cymis patentibus axillaribus folia vix excedentibus et corolla viridi-lutei facile distinguitur.

Caulis brevis, 3–4 cm. crassus, simplex. *Folia* 8–11 cm. longa, 1·6–1·8 cm. lata, 4–5 mm. crassa, lineari-ligulata, basi levissime dilatata, plana, acuta, mucronata, glabra, laetevirentia, sublucida, nec glauca, numerossima, in rosulam 22–25 cm. diam. dense conferta, superiora erecto-patentia, inferiora deflexa. *Cymae* ex axillis inferioribus enatae, pedunculatae, horizontaliter patentes, folia aequantes vel vix excedentes, compactae vel subdensae, multiramosae, floribus 80–130. *Pedunculi* 6–8 cm. longi, 4–5 mm. crassi, pallide virentes, apice tantum bracteiferi. *Bracteae* patentes, 4–9 mm. longae, basi 1·5–5 mm. latae, deltoideo-lanceolatae vel deltoideo-ovatae, acuminatae, basi cordato-amplexicaules, glabrae, laete virentes. *Pedicelli* 4–7 mm. longi, glabri, virentes. *Calyx* 5 (siccate 4) mm. longus, 5-lobus, basi cupularis, glaber, laete virens; lobi erecti, 3 mm. longi, deltoideo-attenuati, acuti. *Corolla* 10 (siccate 8·5–9) mm. longa, 4 mm. diam., subcylindrica, obtuse pentagona, glabra, viridi-lutea; segmenta erecta, acuta, fere ad medium connata. *Stamina* inclusa; antherae luteae. *Carpella* pallide virescentia.

Origin unknown, probably a native of Mexico or adjacent regions. Flowered at Kew during the summer of 1908.

506. **Wrightia sikkimensis**, *Gamble* [Apocynaceae]; *W. tinctoriae*, R. Br., foliis et fructu affinis sed floribus coccineis et praecipue corollae appendicibus inaequalibus dentatis nec fimbriatis differt.

Arbor parva; ramuli teretes, purpurei, lenticellis sparsis notati. *Folia* membranacea, cyaneo-viridia, elliptico-lanceolata vel

obovata, apice obtuse cuspidato-acuminata, basi cuneata, utrinque glabra vel nervis infra pubescentia, 8–12 cm. longa, 3–5 cm. lata ; nervi utrinque 10–12, marginem versus parallele curvati ; petiolus circiter 5 mm. longus, sulcatus. *Cymae* terminales, corymbosae, puberulae, subsessiles, ad 5 cm. longae et latae, dichotomo-ramosae ; bracteae parvae, ovato-acutae, caducae; pedicelli graciles, 10–12 mm. longi ; alabastra conoidea. *Flores* coccinei. *Calyx* parvus, 5-partitus ; lobi orbiculati, ciliati, extra pubescentes, 1–2 mm. longi ; glandulae 5, lobis fere aequilongae, crenulatae. *Corollae* tubus brevis, vix 1 mm. longus ; lobi lanceolati, utrinque fulvo-pubescentes, 8–12 mm. longi. *Coronae* appendices 10, glabrae, oblongo-lanceolatae, integrae vel 2–3-fidae, 5 corollae lobis oppositae, 6–7 mm. longae, et 5 alternae, vix 3 mm. longae. *Antherae* sagittatae, utrinque puberulae, filamentis et connectivo crassis. *Ovarium* 2-carpellatum, glabrum ; stylus gracilis, apice dilatatus ; stigma obtusum. *Folliculi* distincti, glabri, graciles, curvati, apice cohaerentes, ad 25 cm. longi, vix 5 mm. lati. *Semina* carnosa. *Holarrhena* sp. Gamble in Darj. List of Trees, &c., ed. 1. 55. *Wrightia coccinea*, Gamble in Darj. List, &c., ed. 2. 56, non Sims ; Brandis, Indian Trees, p. 461?

INDIA. In the outer hills of the Sikkim Himalaya up to 1220 m. *Gamble*, 574, 769, 3210 (1876) ; below Kurseong, *Brandis* (1879).

507. **Columnea** (**Eucolumnea**) **guatemalensis**, *Sprague* [Gesneraceae] ; affinis *C. glabrae*, Oerst., a qua calycis lobis angustioribus sursum attenuatis superne intra sanguineis recedit.

Ramuli graciles, tetragoni, leviter alati, exsiccando pallide cinerei, 1·5–3 mm. diametro, glabri, novelli tantum longiuscule pilosi. *Folia* oblongo-lanceolata, basi obtusa vel subrotundata, apice subacuta, 2–2·5 cm. longa, 8–10 mm. lata, carnosa, exsiccando opaca, margine leviter revoluto, nervo medio supra impresso subtus prominente, ceteris inconspicuis, supra glabra subtus praecipue in nervis longiuscule appresse sparsiuscule rubro-pilosa ; petioli 2-3 mm. longi, minute glandulosi, appresse pilosi, supra excavati. *Flores* solitarii, pedicellis 6–7 mm. longis dense appresse rubro-pilosis. *Calyx* totus vix 2 cm. longus, extra appresse rubro-pilosus, intus glaber ; tubus 1·5–2 mm. longus ; lobi anguste linearilanceolati, sensim attenuati, superne reflexi, circiter 1·7 cm. longi, 2·5-2·75 mm. lati, 5–6-nervii, intra superne sanguinei. *Corolla* tota fere 7 cm. longa, extra appresse pilosa, intra pilis conicis minutissime puberula, lobo antico anguste oblongo 1·7 cm. longo 5·5 mm. lato obtusiusculo 3·8 cm. supra basin inserto, lobis lateralibus triangularibus cum galea 1·2 cm. connata, margine superiore 1·1 cm. longo, galea propria oblonga (explanata) superne valde depresse triangulari-terminata 1·8 cm. longa, 1·5 cm. lata. *Filamenta* inferne 5–5·5 mm. in vaginam anticam corollae medio 3 mm. adnatam connata, partibus liberis circiter 4·5 cm. longis ; antherae vix ultra 3 mm. longae. *Glandula disci* unica, postica, cucullata, 1·75 mm. longa, 0·6 mm. bifida. *Ovarium* ovoideum, 3 mm. longum, dense albido-villosum ; stylus 6·5 cm. longus, minute glanduloso-pubescens.—*C. glabra*, Donn. Sm. Enum. Pl. Guatem. pars i. p. 32, non Oerst.

GUATEMALA. Sarax, Depart. Alta Verapaz, 1380 m., *Tuerckheim in Donnell-Smith*, 866.

508. **Columnea (Eucolumnea) oblanceolata,** *Sprague* [Gesneraceae] ; species distincta foliis majusculis oblanceolatis, calyce parvo extra tantum dense villoso, lobis subpectinato-dentatis.

Ramuli exstantes circiter 13 cm. longi, obtuse tetragoni, hispidi, inferne 4 mm. diametro. *Folia* anguste oblanceolata, in basin a triente superiore sensim attenuata, apice breviter acuminata, interdum subabrupte, 6·5–11 cm. longa, 1·5–2·5 cm. lata, supra puberula vel glabrescentia, subtus strigoso-pubescentia, praesertim in nervis, exsiccando papyracea ; nervi laterales utrinque 4–5, supra inconspicui, subtus satis prominentes ; petioli 1–2 cm. longi, hispidi. *Flores* verisimiliter in axillis solitarii, pedicellis 2 cm. longis patule villosis. *Calyx* extra praesertim inferne dense villosus, villis aliis glanduloso-capitatis aliis eglandulosis, intra glaber ; tubus 1·5–2 mm. longus ; lobi anguste lanceolati, acuminati, 8–10 mm. longi, 2–3 mm. lati dentibus exclusis, subpectinato-dentati, dentibus utrinque 4–5, longioribus circiter 1·25 mm. longis. *Corolla* tota 5·5–6 cm. longa, extra longuiscule glanduloso-pubescens, intra minutissime pubescens, lobo antico anguste lanceolato obtusiusculo vix 1·5 cm longo 5·5 mm. lato 3·6–3·7 cm. supra basin inserto, lobis lateralibus cum galea 1·2 cm. connatis superne triangularibus, margine superiore 7–9 mm. longo, galea propria transverse elliptica (explanata) 1–1·2 cm. longa fere 1·8 cm. lata truncato-rotundata levissime emarginata. *Filamenta* inferne 10–11 mm. in vaginam anticam corollae in medio circiter 6 mm. inferne adnatam connata, partibus liberis circiter 4·3 cm. longis dense minute patenter pilosis ; antherae 3·5 mm. longae. *Glandula disci* unica, postica, 1·5–1·75 mm. longa, leviter retusa vel bifida. *Ovarium* ovoideum, 3–3·5 mm longum, dense villosum ; stylus vix ultra 5 cm. longus, patule pilosus.

Costa Rica. *Hübsch.*

509. **Arthraxon Meeboldii,** *Stapf* [Gramineae-Andropogoneae] ; affinis *A. lanceolato*, Hochst., sed annua, spiculis longioribus, gluma inferiore spiculae sessilis apicem versus pulcherrime argenteo-plumosa.

Gramen annuum. *Culmi* 2–3 e basi breviter prostrata ascendentes, 15–20 cm. alti, graciles, glaberrimi, simplices, 6–8-nodi, internodiis sursum accrescentibus, summo 5–7 cm. longo vix vel breviter exserto. *Foliorum* vaginae infimae a culmo solutae, caeterae arctae vel superiores plus minusve tumidae, praeter basin ad nodum barbulatam glabrae vel superne pilosae ; ligulae brevissimae, hyalinae ; laminae ovatae vel ovato-lanceolatae, tenuiter acuminatae, basi cordatae, amplexicaules, 2–3·5 cm. longae, 1–1·25 cm. latae, subtus (imprimis in costa) setulis basi subbulbosis obsitae, margine pilis similibus patule-ciliatae, tenuissime multinervosae. *Racemi* in apicibus culmorum bini, 3–4·5 cm. longi, unus pedunculo glabro ad 8 mm. longo suffultus ; articuli anguste lineares, circiter 4 mm. longi, tota longitudine dense argenteo-ciliati ciliis sub apice 2–2·5 mm. longis, dorso praeter basin glabri ; pedicelli similes, sed 3 mm. longi et fere duplo latiores. *Spiculae sessiles* anguste lineari-lanceolatae, longe acuminatae, 9·5–10 mm. longae, 1 mm. latae, callo vix ullo ; gluma inferior coriaceo-chartacea, pallida, acumine purpurascente bifido dentibus angustissimis, carinis a basi ad vel ultra $\frac{3}{4}$ eleganter muricatis

muricibus summis in tuberculos abeuntibus et pilos in barbam argenteo-nitidam dispositos gerentibus, apice ipso glabro, serie tuberculorum muricibus proxima utrinque addita, nervis intracarinalibus tenuibus 3; gluma superior subnavicularis, a latere visa lanceolata, setaceo-acuminata, glumam inferiorem aequans, membranacea, 3-nervis, in carina superne asperula, ad margines tenuissime parce ciliata; valva inferior vacua, elliptico-oblonga, obtusiuscula, 4·5 mm. longa, enervis, valva superior a latere lanceolata, tenuiter acuminata, 6 mm. longa, hyalina, 1-nervis, paulo supra basin aristata, aristae columna brunnea 7–8 mm. longa, seta nitida alba 12–14 mm. longa; palea nulla. *Spiculae pedicellatae* lanceolatae, acutae, chartaceae, 7 mm. longae; gluma inferior superne bicarinata, carinis rigide ciliolatis, caeterum glabra, 9-nervis, nervis subcarinalibus utrinque 2 distinctis, caeteris tenuioribus; gluma superior lanceolata, inferiori subaequilonga, acuta, 3-nervis, ad margines tenuissime reverse ciliata; valva inferior vacua, ovato-oblonga, hyalina, subuninervis, eciliata, fere 4 mm. longa; valva superior cum flore ♂, ovata, bidentula, inter dentes mucronulata, hyalina, 1-nervis, inferiorem aequans cum palea lineari enervi 1 mm. longa. *Antherae* 2·5 mm. longae.

India. Concan, in open grassland on a hillside near Khandale, 600 m., *Meebold*, 9132.

A very elegant species, easily recognised by the silvery beards of the sessile spikelets.

510. **Andropogon (Dichanthium?) serrafalcoides**, *Cooke et Stapf* [Gramineae-Andropogoneae]; ob spiculas secundarias infimas saepissime neutras caeterum eadem forma ac fertiles si vis ad *Dichanthium* referendus, sed nulli speciei arcte affinis, spiculis maiusculis in racemos spiculis Serrafalci haud dissimiles congestis insignis.

Gramen annuum, ad 60 cm. altum, gregarium. *Culmi* graciles, laeves, glabri, e basi tenui ascendente radices fulcrantes emittente erecti, circa 10-nodi, internodiis inferioribus brevibus et ad nodos tumidis plerisque exsertis, superne ramos 1–3 solitarios longos pergraciles agentes. *Foliorum* vaginae infimae breves, laxae, mox a culmo solutae, superiores arctae, glabrae; ligulae hyalinae, ovatae, ciliatae, 1 mm. longae; laminae e basi paulo angustiore lineares, longe tenuiter attenuatae, ad 15 cm. longae, 4–6 mm. latae, flaccidae, plus minusve hirsutae, pilis e tuberculis ortis vel subglabrae, costa tenui utrinque prominente, nervis lateralibus obscuris. *Racemi* solitarii in culmorum et ramorum apicibus, oblongi, vel obovato-oblongi, 1–1·75, raro 2 cm. longi, 5–7 mm. lati, arcti vel superne subaperti, 4–6-nodi; articuli inter nodos 2 vel 3 infimos continui, breves, cylindrici, glabri, caeteri ad 1·75 mm. longi, secedentes, subclavati, latere exteriore dense sericeo-ciliati ciliis summis articulum aequantibus vel excedentibus; pedicelli infimi brevissimi, glabri, caeteri e basi angusta clavati, subflexuosi, uno latere dense sericeo-ciliati, altero in dentem lanceolatum cartilagineum producti, 2 mm. longi. *Spiculae* arcte imbricatae vel summae subdivergentes stramineae, scariosae, glaberrimae. *Spiculae sessiles* ☿ (nisi infima saepissime neutra); gluma inferior lanceolata in alis late alata, cum alis scariosis oblonga vel elliptico-oblonga, acuta vel breviter bifida vel apice

sublacerata, 8–9·5 mm. longa, inter carinas 7–9 nervis, marginibus angustissimis inflexis ; gluma superior, lanceolata, acuta, 6–6·5 mm. longa, 3-nervis, papyracea ; valva inferior vacua, oblonga, obtusa, hyalina, enervis vel sub 1-nervis, 3·5–4 mm. longa ; valva superior stipitiformis in aristam gracilem abiens, columna circiter 15 mm. longa arcte torta nigro-fusca nitente, seta paulo longiore pallida vel arista spiculae sessilis basalis et subbasalis imperfecta vel ad setulam minutam reducta ; palea nulla. *Spiculae pedicellatae* sessilibus similibus, sed neutrae, paulo obliquae vel tortae, alis inaequilateris, gluma superiori 5-nervi, valvis admodum reductis vel superiore suppressa. *Antherae* 1·5 mm. longae. *Caryopsis* ambitu elliptico-oblonga, a dorso compressa, 3 mm. longa. *A. Cookei*, Stapf ex Woodrow in *Journ. Bombay Nat. Hist. Soc.*, vol. xiii., p. 438 (nomen tantum).

INDIA ORIENTALIS. Western Ghats, Sakarpattar, near Lanauli. *Woodrow* !

LVIII.—MISCELLANEOUS NOTES.

Presentations to Gardens.—The collections of living plants at Kew are maintained in as complete and representative a condition as is possible by means of purchase and exchange. Plants that are likely to prove valuable in distant parts of the empire are propagated and distributed as far as the resources of the establishment will allow. Kew is largely indebted to other botanic gardens for contributions of plants and seeds, especially to the gardens at Calcutta, Ceylon, the Straits Settlements, Jamaica and Trinidad. From the Arnold Arboretum about 500 packets of seeds collected by Mr. Wilson in China and a collection of choice trees and shrubs have been received. A selection of Chinese trees and shrubs from Mr. Meyer's collection has been presented by the United States Department of Agriculture. Exchanges have been effected with the botanic gardens of Berlin, Paris, Brussels, and the Colonial garden of the Congo Free State ; also with the botanic gardens at Edinburgh, Glasnevin and Cambridge. From the Rubber exhibition held at Olympia various rubber plants were presented to Kew by exhibitors, including *Urceola* and *Parameria* from Lieut.-Col. Wyllie, Rangoon ; *Hevea guianensis* from Mr. J. G. van Hemert, Amsterdam ; *Dichopsis gutta* and *Mimusops Balata* from Dr. W. Troup de Haas, Java ; and stems of *Castilloa elastica* from the Orizaba Rubber Plantations, Ltd., Mexico. Tubers of *Raphionacme utilis*, the source of Bitinga rubber, were presented by the Companhia de Moçambique, 13 Austin Friars. Seeds of *Pouteria suavis* were purchased from Mr. E. Frosio, Paysandu, Uruguay, and from them a batch of young plants has been raised ; these will be ready for distribution next year. With the assistance of Mr. J. A. Davy, Fazienda Dumont, Sao Paulo, Brazil, a large quantity of seeds of Remanso (*M. piauhyensis*) and Jequié (*M. dichotoma*) Maniçoba rubbers was obtained and distributed to 32 botanical and agricultural stations in the tropics ; seeds were also received from Mr. D. R. O'Sullivan Beare, H.M. Consul, Bahia. Mr. T. A. Dorrien-Smith, Tresco, presented a large collection of new or rare plants which had been brought by his son, Captain A. A. Dorrien-Smith, from New Zealand ; the Hon.

Walter Rothschild, Tring, presented a collection of valuable orchids; the Rt. Hon. J. Chamberlain, Highbury, presented hybrid orchids; the Hon. Vicary Gibbs, Aldenham House, sent a set of Chinese plants, and Messrs. Philippe and Maurice de Vilmorin various trees and shrubs. Kew is also indebted to various nurserymen for valuable contributions of plants, and especially to Messrs. J. Veitch & Sons, Chelsea; Messrs. F. Sander and Sons, St. Albans, and Messrs. H. Low & Co., Enfield.

W. W.

Presentations: Waterfowl.—A Mandarin Duck from the Zoological Society of London.

A pair of Mandarin Ducks presented by Col. C. G. Tottenham, Bally Curry, Ashford, Co. Wicklow, Ireland.

A pair of Common Sheldrakes presented by Mr. T. A. Dorrien-Smith, Tresco Abbey, Isles of Scilly.

A Black Swan, female, presented by H.M. Office of Works, from Regents Park.

Glastonbury Thorn. (*Crataegus monogyna* var. *praecox*).—The sacred legend which is associated with the flowering of this thorn in midwinter always gives the tree a peculiar interest to the general public. There is a specimen of it growing in the Thorn Avenue at Kew (south of the Temperate House) which does not flower regularly in midwinter. With a mild November and December such as is frequently experienced, it will flower about Old Christmas Day (January 6th), but if cold weather sets in before the New Year the flowers may not open until March or April. This year, however, they have been extraordinarily early. The tree was in full blossom in the first week of November, before any leaves had fallen. This was no doubt accounted for by the unusual warmth of the past autumn. In addition to these early blossoms, the Glastonbury Thorn at Kew always bears others at the normal flowering time of the species—May and June—and from them a crop of haws is developed. This tree was, in November, carrying flowers, fruit and full foliage simultaneously.

W. J. B.

The History of the Royal Botanic Gardens.*—To the firm of Messrs. Cassell and Company we owe the publication of an account of the Royal Botanic Gardens, Kew, the object and scope of which may best be gathered from the opening paragraphs of the introduction supplied by the late Director which are here reproduced.

"It had long been my desire to write some sort of history which would trace the beginnings and development of Kew and of all the name stands for. I believe that my predecessor in the

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* The Royal Botanic Gardens, Kew: Historical and Descriptive. By W. J. Bean, Assistant Curator. With an introduction by Sir William Thiselton-Dyer, K.C.M.G., &c.

Directorship cherished the hope that he too might accomplish the task, and I suppose that in each case the same causes defeated the intention. As with many other Government posts, the man who would control all the various activities of Kew must 'scorn delights,' even those under his immediate eye, 'and live laborious days'; he must be content, however imperfectly, to do what he can, not what he would; and must swallow, with what philosophy he may, continual discontent that the day's work cannot be crammed into the day's hours. No assistance can aid him beyond a certain point, and no one can share his responsibility.

"For some years past Mr. Olivier and Mr. Wallis—the one with the brush, the other with the camera—had devoted themselves to the illustration of Kew in its varying aspects with delightful skill. The publishers were willing to give a selection of their admirable work to the public if only the long projected book could be produced which it would serve to illustrate. The opportunity was not to be lost; it might not, and probably would not, ever recur. That the thing must be done at Kew was obvious; history may be evolved from consciousness, but it cannot be written with circumstantial accuracy without data and documents. It was a happy inspiration which led me to induce the publishers to entrust the work to the Assistant Curator. He has devoted his life to Kew, is penetrated with sympathy with its charms, and much that has enhanced them has been accomplished under his capable hand. And having read his proofs I find nothing to criticise, and can but admire the ability with which he has marshalled a vast mass of information never before brought together, and told a story with words of befitting gravity and simplicity which is to me of the deepest interest, and, I am persuaded, can be scarcely less so to its other readers.

"These few words would be sufficient to introduce those who have worthily taken part in the production of the book. But looking back upon Kew in a long retrospect, I may summarise some of the salient impressions which emerge from the mass of detail. Amongst our scientific institutions, Kew stands out with a history which is almost august. And it is characteristic of English tradition that its present constitution is the outcome of an almost inevitable evolution. Circumstance has made it, and this has given it a stability which it would not have possessed if it had been the creation of the moment, however logical.

"Outside the metropolis there is probably no spot which has seen so much history as the piece of ground included within the bend of the Thames which lies between Kew and Richmond bridges. Successive dynasties made it their residence, first in its southern and then in its northern portion. Henry VII. built the palace at Richmond, in which his successor entertained the Emperor Charles V. Queen Mary lived there, and in it Elizabeth signed the death warrant of Mary Queen of Scots, and died herself. Her court, on their way to London by Brentford Ferry, must have passed along Love Lane, which traversed the Gardens. Here was the original hamlet of Kew, which in Hanoverian times was moved eastwards round Kew Green. The etymology of the name is obscure, but the earliest form, Kay-hough, was perhaps derived from the landing-place of the ferry. Midway, at Ormonde

Lodge, George II., gave Sir Robert Walpole a rough reception when he was roused to hear of his accession to the throne, and it was in the adjoining gardens that Sir Walter Scott placed the interview of Jeannie Deans with Queen Caroline, one of the most capable of our queens. At Kew itself was the residence of the Princess Dowager of Wales and of her son, George III. Here he gave Lord Bute his dismissal, his children were brought up, and two of his sons, William IV. and the Duke of Kent, were married in the presence of the dying Queen Charlotte.

"And the impress of this history remains on Kew. The various domains which compose it have been alternately united and dissevered. But in its main features it still remains as George III. left it, though it has been perfected and refined in its details. The royal influence and atmosphere persists. It is the stately garden of a great personage, though that is now the British public and no longer the sovereign."

Holly, Yew and Box.*—The collections of Holly, Yew and Box in the Arboretum at Kew are, no doubt, more extensive than any others existing in the British Isles, and Mr. Dallimore's long experience amongst them has made him specially well-fitted to deal with the subject-matter of this work. It is an important subject for gardeners, because, in spite of all the evergreen shrubs that have been introduced from other countries, these three native evergreens remain as indispensable as ever. In a botanical sense the most important feature of this work is the segregation of the broad-leaved varieties of garden Holly under *Ilex platyphylla*. Previous monographers, including Moore, have always put these broad-leaved Hollies, such as *balearica*, *nigricans*, *Hodginsii*, &c., under *I. Aquifolium*. Mr. Dallimore's researches have led him to a different conclusion, and it seems to us with very good reason.

Whilst the book will, no doubt, be henceforth regarded as the standard work of reference on these plants, containing as it does full descriptions of all known varieties of Holly, Yew and Box, it is a good deal more than a mass of descriptive detail. The author has gathered together a most interesting series of poetical and legendary allusions, and he gives, besides, a well-written account of the economic value of these trees, their real or supposed medicinal properties, and the uses, cultivation and propagation of the plants in gardens. Of the two kinds of works of reference—the ones which say a little about many subjects, and those that profess to say all there is worth saying about a few—Mr. Dallimore's book is a conspicuously successful example of the latter. It would, indeed, be difficult to point to anything of value or interest about the Holly, Yew or Box that he has left unsaid.

The final part of the book which deals with "other evergreens" is more discursive and fragmentary, and appears to have been a sort of afterthought. Still, it contains in a condensed form much valuable information and will be useful to planters searching for

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* Holly, Yew and Box, with chapters on other Evergreens. By W. Dallimore. Bodley Head.

the best evergreens. The book is well printed on good paper, and the illustrations (mostly from photographs taken at Kew) are admirably reproduced. The varieties of common Holly are illustrated by outline drawings of single leaves which originally appeared in the "Gardeners' Chronicle."

Rhus Toxicodendron.—An article by Sir Ray Lankester in the "Daily Telegraph" of August 8th last has once more drawn public attention to the singular toxic properties of this hardy shrub. Notes and papers on the same subject have from time to time appeared in the botanical and horticultural press, but it evidently required the publicity which the columns of a great daily newspaper alone can give to awaken a general interest in it. Whilst a widespread attention has thereby been drawn to a matter on which it is very desirable the general public should be informed, the process has been accompanied by the dissemination of certain inaccuracies—which, indeed, appears to be inevitable whenever a subject of this kind is dealt with in the popular press—and much unnecessary alarm has been caused.

Rhus Toxicodendron (which is now taken to include also the *R. radicans* of Linnaeus) is widely spread over the eastern portions of North America, and is found in certain parts on the western side. It occurs also in Japan. Sometimes it takes the form of a loose, wide-spreading shrub; sometimes it is a climber. Not only is it variable in mode of growth, but also it exhibits a great diversity in the size and shape of its leaves. Although these are said to be occasionally quinquefoliate, they are almost always trifoliate. The three leaflets of a particular leaf are sometimes similar in size and shape, but usually the middle one is larger than the other two, and it has, invariably, a longer stalk. The margins are either entire or coarsely toothed, the coarse toothing being apparently more characteristic of young plants. In the autumn tints of its foliage this shrub is one of the most handsome we possess, dying off as it does into various rich shades of red. Some years ago the climbing form was distributed from a nursery as *Ampelopsis Hoggii*—a name which has, of course, no justification, but which was no doubt suggested by its similarity in leaf and colouring to *Ampelopsis Veitchii*. This is an instance in which the propensity of some plant dealers to give new names to old plants without troubling to have their identity established has been attended by a certain danger to the public, in addition to the inconvenience and confusion this practice always entails.

In the "Daily Telegraph" article a wrong description of *Ampelopsis Veitchii* was given. It was there stated that this plant has a "five-pointed leaf." This, of course, it never has. But many who read the article at once went to examine their *Ampelopsis Veitchii*, and, finding no "five-pointed" leaves there, but plenty of trifoliolate ones which fitted the description of *Rhus Toxicodendron*, they were immediately struck with the fear that they were entertaining unawares the dreadful poison-ivy. As a matter of fact *Rhus Toxicodendron* is a rather uncommon plant out of large gardens. Over 140 letters and specimens were received in

a few days at Kew in connection with this question, but in only five cases was the true poison-ivy sent.

The poisonous effects of *Rhus Toxicodendron* on the skin have long been known. As long ago as 1623 the author of the "Historye of the Bermudaes" alluded to them, and there is now quite an extensive although scattered literature on the subject. Although its effects do not appear to be so violent in this country as in North America, numerous instances of Rhus poisoning are known to us here. The juice produces blisters and eczema-like eruptions on the skin, often accompanied by a general feeling of uneasiness and depression, in addition to the itching, pain and inflammation of the parts particularly affected. The supposed active principle, named "toxicodendrol" by Dr. F. Pfaff of Harvard, is insoluble in water. It is, therefore, of no use to attempt to remove the juice from the skin by washing with water. It saponifies and is rendered inert in conjunction with alkalies, and readily dissolves in alcohol. The best remedy to apply to the skin is an alcoholic solution of sugar of lead (lead acetate) which is said to give immediate and permanent relief. (*See* article by V. K. Chesnut in *Yearbook of the U.S. Department of Agriculture* for 1896, p. 139).

Among the recent correspondents of Kew was a lady who sent the true *Rhus Toxicodendron* with the remark that she had used the leaves for dinner-table decoration. As no evil consequences were recorded she was evidently one of the persons who are immune from the effects of this poison. This correspondent also drew attention to an interesting property of the juice of this plant, namely, its indelibility when applied to linen and similar fabrics. She found that wherever the liquid touched the white table-cloth it produced a perfectly ineradicable stain, and remarks that "it is really better for marking purposes than many so-called indelible marking inks." This property has long been known to botanists. Kalm noticed it during his travels in North America about the middle of the 18th century. And in Woodville's "Medical Botany" (1832) it is stated that "this juice, applied to linen, forms one of the most perfect kinds of indelible ink; it does not fade from age, washing, or exposure to common chemical agents . . . . . but continues to grow darker as long as the linen lasts." It may be mentioned that the juice (which immediately exudes from a broken or cut surface of the wood or leaf-stalks) is at first milky and yellowish, but soon becomes black.

W. J. B

Presentations to Museums.—Forestry Exhibits.—His Grace the Duke of Wellington, K.G., Stratfieldsaye, Mortimer, Berks. Specimens of hazel damaged by rabbits, and pine cones nibbled by squirrels.

The Most Honourable the Marquess of Bath, Longleat, Warminster. Specimens of various timbers damaged by honeysuckle and a specimen of holly encircled by ivy.

The Right Honourable the Earl Beauchamp, Madresfield, Malvern. Specimens of larch timber grown under various conditions,

section of a tree of *Pinus sylvestris* killed by rifle bullets, photographs of hoop making, charcoal burning and coppice beech from stools, &c.

Sir C. T. Dyke Acland, Bart., Holnicote, Taunton. Twenty-nine planks of various timbers, including Lucombe oak, wild cherry, Wych elm, alder, lime, holly, &c.

Lady E. F. Smyth, Ashton Court Estate. Series of specimens showing damage done by squirrels and rabbits to fir, sycamore, ash, larch, &c. Specimens of ash with holes bored by woodpecker, and other material to illustrate injury caused by the entwining of honeysuckle, also young plants of beech and larch injured by ants.

The Director of Forestry, Manila. A collection of 106 sections of Philippine woods.

H.E. the Hungarian Minister of Agriculture, from the Hungarian Exhibition, Earl's Court, per Mr. Földi. A large and varied collection of timber specimens and forestry products; per Mr. Krolopp, 37 specimens in fluid of vine diseases prepared by the Royal Hungarian Ampological Institute, and 13 photographs of parks in Hungary.

International Rubber Exhibition, Olympia. From the Ceylon Association, London. Stems of Para rubber (*Hevea brasiliensis*) to illustrate the different methods of tapping, stem of *Manihot Glaziovii* the Ceara rubber tree, 17 samples of Para rubber, oil from Para rubber seed, and latex from the Jack tree (*Artocarpus integrifolia*). Exhibited in the Ceylon section.

Mr. H. N. Ridley, F.R.S., Director, Botanic Gardens, Singapore. Stem, various samples of rubber and two herbarium specimens of *Hevea brasiliensis*, from the Malay section, Olympia.

Mr. E. Maurer, New York. Plant of Guayule (*Parthenium argentatum*) and samples of raw and manufactured Guayule rubber. Olympia.

Mr. J. G. van Hemert, Amsterdam. Portion of tapped stem of Balata (*Mimusops Balata*) and samples of crude and purified balata from Surinam. Olympia.

Orizaba Rubber Plantations, Ltd. Stems of *Castilloa elastica*. Olympia.

Mr. G. A. Witt. Ordinary block and laminated Rambong rubber (*Ficus elastica*), Sumatra. Olympia.

Mabira Forest (Uganda) Rubber Co., Ltd. Samples of Crepe rubber from *Funtumia elastica*, and photographs of the rubber industry. Olympia.

Franco-British Exhibition. From the Indo-China section, per M. C. le Jeune, a large and varied selection of raw vegetable products, including resins, oil-seeds, dyes, tans, fibres, &c.

From the Tunis section, per M. T. Simonot. A collection of varied products, including cereals, cork, fibres, olives and olive oil.

From the French West African section, per M. Max Robert. A large and miscellaneous collection of vegetable products, including gums, resins, cotton, rubber, ground-nuts and implements used in the cultivation, oil palm products, &c.

M. Raynaud, Biarritz. Map, with illustrations, of the Truffle districts and industry in France, per Senator Dr. Albert Viger. French Agricultural section.

Mr. M. Ulcoq. Portfolio of dried plants and three planks of timber from the Mauritius section.

The following presentations have also been recently made to the Museums :—

Mr. A. M. Burn Murdoch, Conservator of Forests, Federated Malay States. Wood of *Balanocarpus maximus*, with Damar adhering to the bark, and two photographs of Damar trees.

Mr. R. Derry, Assistant Superintendent, Botanic Gardens, Singapore. Sample of Gutta Jelutong from *Dyera costulata*.

Mr. Francis Fox, C.E. Section of beech wood from the foundations of Winchester Cathedral.

Mr. F. Beresford Wright, Wootton Court, Warwick. A piece of oak wood from the oak and cement foundations of the Roman bridge (discovered in 1792) over the River Trent, East Bridgeford, built about A.D. 120.

Mr. F. H. Hunicke, New York. Rubber specimens to show the method of preparation of rubber from *Landolphia Thollonii*, from Black River, Congo Free State.

Messrs. Thomas Turner & Co., Cassiobury Mills, Watford. Specimens illustrating the manufacture of dumb-bells of elm and beech, Indian clubs of elm, felloe of ash, spoke of ash, &c.

Messrs. Walter Rogers, Sons, & Barnes, Watford, Herts. Specimens to illustrate the manufacture of rake handles and scythe sneaths of birch and various tool handles of ash.

Messrs. Thos. Wright & Son, Waterside, Chesham. Various articles made of home-grown timbers, including spades, hoops and articles for domestic use.

Assistant-Director, Royal Gardens, Kew. Samples of maize from the vicinity of La Paz, Bolivia, 11–13,000 ft., and samples of Quinoa (*Chenopodium Quinoa*), a farinaceous seed used as food. From the shores of Lake Titicaca, 12–13,000 ft. Bolivia.

J. M. H.

Landolphia Thollonii, *Dewèvre.*—Mr. Felix H. Hunicke, of the Continental Rubber Company of America, whose name is known in connection with the Guayule rubber industry of Mexico, has recently visited the neighbourhood of the Black River, Stanley Pool District, Congo Free State, and has kindly presented to the Royal Botanic Gardens, Kew, a series of samples illustrating the process which he has evolved for obtaining a good sample of rubber from the bark of the roots of *Landolphia Thollonii*. The roots are cut up into sections from which the bark is removed, and the woody portions are then discarded. The separated bark is then placed in the "Hunicke" machine and ground to powder, with the result that the finely-granulated bark falls out and the rubber is left behind. This rubber appears to be practically free from the

impurities of pieces of bark which are always to be found in considerable quantity in the rubber as extracted by the natives. The rubber may be sheeted or exported direct in the somewhat granular form in which it is turned out by the process. The rubber is of very good quality, and the yield from the roots is said to be about 10 per cent. As the process is of a simple character, and there is an abundance of water power, the new process seems likely to make a considerable advance in the value of the *Landolphia* root rubber.

The value of the *Landolphia*, however, does not end with the rubber, for from the granulated bark a fine, rich, red-brown dye is obtained. Mr. Hunicke has presented samples both of the granulated bark and of the dye, and also specimens of the impure rubber as extracted by the natives, and a herbarium specimen of the leaves and flowers of *Landolphia Thollonii*.

A sample of the root of *Landolphia humilis*, K. Schum., with a herbarium specimen also accompanies these specimens. The rubber from this plant is small in quantity and of very little value.

A sample of the root and a herbarium specimen of *Carpodinus lanceolata*, K. Schum., from the Black River, Congo, are also included.

Sideroxylon novo-zelandicum, *Hemsl.* (syn. *Achras novo-zelandica*, F. Muell.).—As long ago as 1875, the late Sir Ferdinand von Mueller pointed out (*Fragm. Phytogr. Austral.* vol. ix. p. 72) that the New Zealand plant, generally referred to the Norfolk Island *Achras costata*, Endl. (*Prodr. Fl. Norf.* 1833, p. 49 ; *Iconogr. Gen.* Pl. t. 83), did not agree with Bauer's drawings. Comparing the Norfolk Island specimens with those from New Zealand, I think Mueller was right. The leaves of the Norfolk Island plant are on the whole larger, thicker, more tapering towards the base, and the petioles are longer. The flowers are usually in pairs in typical *A. costata*, and solitary in the New Zealand specimens we have seen. Kew, however, possesses no well-developed flowers from Norfolk Island, but the calyx in the fruiting specimens is much larger than in *S. novo-zelandicum*.

W. B. H.

Asiatic Lardizabalaceae.—*Hooker's Icones Plantarum*, vol. xxix. (December, 1907) tt. 2842–2849, contains figures and descriptions of a number of Asiatic, mainly Chinese, members of this family, including a new genus, *Sinofranchetia*, Hemsl. ; and in the letterpress to t. 2843 *Holboellia*, Wall. (1824) and *Parvatia*, Decne. (1837) are reduced to *Stauntonia*, DC. The reasons for this course are not so fully discussed as they might be ; but I did not judge that it was necessary to enter into details, because I was merely following what had been done long ago by Wallich and Griffith. However, one of the principal reasons given is the presumed insufficiency of the presence or absence of petals (nectaries) as a generic character, and unfortunately the explanation was so phrased as to convey the impression that it was

inconstant in the same species. This was not intended; but Mr. F. Gagnepain, in a "Revision des Lardizabaleés Asiatiques de l'Herbier du Muséum," in the *Bulletin du Muséum d'Histoire Naturelle*, 1908, pp. 64–70, has understood it in that sense, and says: "M. Hemsley a fait trop bon marché d'un caractère que j'ai reconnu parfaitement fixe et invariable après la plus part des botanistes descripteurs." On this ground he restores *Holboellia* and *Parvatia* to generic rank. Confining myself to the genera in question, his main distinctions are :—

A. Petals nectariferous, 6, at least in the male flowers.
  1. Stamens free ... ... *Holboellia.*
  2. Stamens united by the filaments ... *Parvatia.*

B. Petals none, even in the male flowers.
  1. Stamens united by the filaments ... *Stauntonia.*

From this classification it may be seen that petals (nectaries) may be present with either free or monadelphous stamens, and free or united stamens constitute the only difference between *Parvatia* and *Holboellia*. As quoted above, Gagnepain says of *Stauntonia*: "petals (nectaries) none, even in the male flowers," without reference to any supernumerary organs of any kind in the female flowers; but in *Stauntonia chinensis*, DC. (*Hook. Ic. Pl.* t. 2846) there are six small, scale-like, fleshy organs in the female flowers. The organs present have the appearance of nectaries rather than that of staminodes, but their true nature can only be determined from fresh material, or by anatomical examination. The female flowers of *S. obovata*, Hemsl., contain similar, though smaller organs, about 0·5 mm. long. Given the presence of nectaries in the female flowers of *Stauntonia* (in the restricted sense), their absence from the male flowers of the same species is practically the only point of difference from *Parvatia*, Decne.

Admitting, as I do, that any one of these characters, or combination of two of these characters, is constant in the same species, they are hardly generic distinctions, especially as they do not correlate with other floral or vegetative characters. Mr. Gagnepain lays great stress on the fact that he has found no instance of the absence of nectaries where the stamens are free (*Holboellia*), or their presence where the stamens are united (*Stauntonia*), and also on the fact that the figures in the *Icones Plantarum* bear out this statement. That is true, if we ignore *Parvatia*, as he does in this discussion. However, apart from the characters in question, there are others deserving of consideration in the limitation of genera. Gagnepain has nothing to say about staminodes, except that in his description of what he takes to be the female flowers of *Stauntonia parviflora*, Hemsl., he has: "Staminodia parvula, 6." Now, the question arises whether they are really staminodes or nectaries; a question difficult to answer, because undoubted staminodes—imperfect stamens—sometimes bear glands or nectaries. But in some species of *Stauntonia* (in the broad sense) there are both staminodes and nectaries present in the female flowers as separate organs. This is the case in *S. hexaphylla*, Decne. and in *S. longipes*, Hemsl. (*Hook. Ic. Pl.* t. 2848), but, as already stated, I have not found any nectaries (petals) in the male flowers of the former; yet they are present in the male

flowers of the latter, though very small. In *Parvatia*, as described and figured by Decaisne, the nectaries (petals) are relatively large in the male flowers, and the nectaries and staminodes are very small in the female flowers. These three examples represent the three proposed genera: *Stauntonia*, *Holboellia*, and *Parvatia*, the female flowers of which are in other respects exactly of the same structure, differing only in the size and shape of the parts. This reduces the distinctions to the slight modifications indicated in the male flowers, which amount to :—

Presence of nectaries associated with free stamens	*Holboellia.*
Presence of nectaries associated with united stamens	*Parvatia.*
Absence of nectaries [from male flowers]; stamens united	*Stauntonia.*

Mr. Gagnepain does not attempt to show that there are other differences, and, it may be added, there are none in the vegetative characters. Therefore I believe it will be generally conceded that there is no justification for restoring *Holboellia* and *Parvatia* to generic rank. Combined with *Stauntonia* they together constitute a genus as distinct as *Decaisnea*, *Akebia*, or *Sinofranchetia*.

Coming to species Mr. Gagnepain's views are again opposed to mine, but here it is aggregation instead of segregation. For example, under *Holboellia latifolia*, Wall., he places *H. angustifolia*, Wall., and *Stauntonia longipes*, Hemsl., together with other forms, as varieties. They are certainly closely allied, but I am still of the opinion that it is better to call them species and give them one name instead of two.

W. B. H.

Hooker's Icones Plantarum.—Part 3 of Volume XXIX. of this work appeared in September. It is wholly devoted to the illustration of new Chinese and Indo-Chinese species of *Impatiens*, described by Sir Joseph D. Hooker, who has spent the greater part of the last five or six years studying this difficult genus. The species described and figured exhibit a great variety in floral structure. The author employs the term labellum for the spurred sepal ; standard for the odd petal, and wings for the two 2-lobed lateral petaloid organs, usually considered as consisting of two connate petals. Most of the species figured have relatively small flowers. *I. attopeuensis* belongs to a group characterised by the lobes of the wings terminating in a thread-like continuation, and a strongly keeled, 2-lobed standard. *I. Lanessani* is one of a set in which the distal lobes of the two wings are connate, and the spur of the lip very short, curved upwards and slightly notched. *I. verrucifer* is remarkable in having two large glands at the base of the blade of the leaf. In *I. zygosepala* the sepals are large and connate, enclosing the very short, broad labellum. *I. Abbatis* has four well-developed sepals ; a lip with a very broad spur and scarcely any limb ; a very small standard, and very oblique wings. *I. Balansae* and *I. claviger* are relatively large-flowered species of similar structure. *I. Leveillei* is distinguished by the very small

standards being furnished with a dorsal curved horn. *I. atherosepala* has armed sepals. In short, each species exhibits some interesting character. Many, indeed most of these species were described and figured from very fragmentary material, but Miss Smith has been quite successful in building them up.

W. B. H.

Botanical Magazine for October.—The handsome Globe Thistle, *Echinops Tournefortii*, Ledeb., figured on plate 8,217, is a native of Armenia and Persia, and was first described from plants raised in the Dorpat Botanic Gardens from seeds collected on Mount Ararat. Its globose heads of white flowers are sometimes as much as five inches in diameter. The plant figured originally came from the garden of Canon Ellacombe at Bitton, Gloucestershire. *Rosa sericea*, Lindl., var. *pteracantha*, Franch., a white-flowered species with elegant foliage, is remarkable for the large compressed decurrent red prickles which clothe its branches. It is a native of Western China and Manipur, and was first introduced into European gardens by Mr. Maurice L. de Vilmorin. The Kew plant from which the drawing was prepared was purchased from Messrs. Paul of Cheshunt, in 1906. *Anisotes diversifolius* is a representative of a small genus of Acanthaceae allied to *Justicia*, natives of Arabia, Tropical Africa and Socotra, the last named being the home of the species now figured from a specimen presented to the gardens by Colonel Beddome. Its flowers are two-lipped, flame-coloured or yellow, 1½–2 in. long. *Lewisia Cotyledon* is an acaulescent perennial, with rosulate fleshy leaves and flowers about an inch and a quarter in diameter, white, densely lined with red. It is an attractive plant resembling in its flowers certain species of *Oxalis*. The specimen figured came from the Siskiyou Mountains, Oregon, and was presented by Mr. P. B. Randulph, of Seattle, Washington, in 1906. The last plate is given to an interesting Asclepiad, *Raphionacme utilis*, Brown & Stapf, the tubers of which yield a large quantity of rubber reputed to be of good quality. It is a native of the interior of Angola, and has been identified with the "Ecanda" or "Marianga" Rubber-plant. Some tubers were presented to Kew in 1907 by the Companhia de Moçambique, and in the *Kew Bulletin*, 1908, pp. 209–215, where the plant is originally described, particulars relating to its field culture are supplied.

Botanical Magazine for November.—The plants figured are: *Mussaenda erythrophylla*, Schum. et Thonn., *Meconopsis sinuata*, Prain, var. *latifolia*, Prain, *Berberis yunnanensis*, Franch., *Columnea magnifica*, Klotzsch et Hanst., and *Pyrus sinensis*, Lindl. The *Mussaenda*, a Tropical African species, has been sent to Kew by Mr. H. N. Ridley, Director of the Singapore Botanic Gardens. It was first introduced into cultivation by Mr. Gustav Mann in 1863, and a second time in 1886, by Mr. W. Micholitz, collector for Messrs. Sander & Sons, but it does not appear to have become established, and probably soon disappeared from gardens. In this striking plant one of the calyx-lobes in some of the

flowers is as much as five inches long and four inches broad, and of a brilliant crimson colour. The pretty *Meconopsis*, with large light-blue flowers, was raised at Kew from seeds sent from Kashmir, in 1906, by Lieut.-Col. Appleton. It differs from the type, which is not in cultivation, by having broader leaves and a shorter capsule. *Berberis yunnanensis* is one of Mr. Maurice L. de Vilmorin's introductions from China, and Kew is indebted to him for the plant from which the drawing was made. Its lemon-yellow flowers and red ellipsoid berries are larger than is usual in the cultivated species. *Columnea magnifica* is a Central American species which was brought into cultivation by Messrs. V. Lemoine & Sons, of Nancy, about four years ago. The figure was prepared from specimens presented by Col. Beddome and Mr. W. E. Gumbleton. *Pyrus sinensis* is a native of Manchuria and Korea, and for a considerable time has been cultivated in Northern China and Japan. It was introduced into this country in 1820, and has been grown at Kew since 1875, when the late Prof. Decaisne presented to the establishment a collection of grafts of *Pyrus*, including some of *P. sinensis*. Its white flowers are produced freely at Kew, but fruits, which are very astringent, do not ripen very freely.

Botanical Magazine for December.—*Eupatorium Raffillii*, Hemsl. (t. 8227), supposed to be a native of Central America, was procured by Mr. C. P. Raffill of the Tropical Department, Kew, from the Birmingham Botanic Garden, where it has been grown for many years under the name of *E.* (*Hebeclinium*) *ianthinum* from which it may be distinguished by the arachnoid-tomentose inflorescence, the larger subumbellate capitula, and the fewer bracts of the involucre. *Corytholoma macropodum*, Sprague (t. 8228), is a South Brazilian Gesneraceous plant, with subumbellate cinnabar-red flowers, for which Kew is indebted to Mr. G. H. Weigt, Director, Botanical Parks, Piracicaba, Brazil, who communicated seeds in 1906. The stems, which arise from a subglobose tuber, bear only one or two pairs of shortly stalked suborbicular leaves. *Eria hyacinthoides*, Lindl. (t. 8229), is a pretty Javan species, which produces in May several spikes of white flowers. The plant figured was presented to Kew by Mr. F. W. Moore, of the Royal Botanic Gardens, Glasnevin, in 1903. *Cytisus decumbens*, Spach (t. 8230), is a small trailing shrub with bright yellow flowers, a native of South Europe, where it is widely distributed. The Kew plants originated from seeds received from the Goettingen Botanic Garden in 1895. *Hibiscus aponeurus*, Sprague & Hutchinson (t. 8231), was recently described for the first time in the *Kew Bulletin* from dried specimens sent to Kew by several collectors in Tropical East Africa. It has now been introduced into cultivation by Lady Hindlip, who collected seeds in British East Africa and who, in 1905, presented cuttings to Kew. The volume of the Magazine completed with this issue is dedicated to Sir Joseph Dalton Hooker, O.M., G.C.S.I., C.B., who for the remarkably long period of forty years was its editor, and to whom the publication so largely owes the high position it holds amongst the botanical and horticultural literature of the world.

Richard Spruce.—The Botanical manuscripts of the late Richard Spruce have recently been presented to the Library through the kindness of DR. ALFRED RUSSEL WALLACE. In offering the volumes to Kew, Dr. Wallace wrote to the Director on November 11th, 1908, from Broadstone, Wimborne, as follows.—"I am empowered by Dr. Spruce's executor, Mr. M. B. Slater, to offer to the Kew Botanical Library the following MSS. Journals and notes of Spruce, together with the letters received by him from various botanists as enumerated in the List enclosed.

"To them I add the letters to Mr. W. Borrer which have come into my hands as executor of the late Mr. W. T. Mitten.

"Please inform me if these or any of them will be acceptable and I will at once forward them."

The following is the list of Spruce's Botanical Manuscripts enclosed by Dr. Wallace.

"Plantae Amazonicae. 2 vols. bound.

"Plantae Andinae. 2 vols. bound. Containing numerical Register (up to 6580) to his flowering plants and ferns. Often with detailed descriptions.

"MSS. Vol. I. (bound). Containing a large number of notes and short articles, on various scientific subjects, but very largely botanical.

"MSS. Vol. II. (bound). Containing the whole of his original 'Journal' from July 1851 to July 1855. (Last 4 months at Manaos to his arrival at Tarapoto, Peru.) This is full of botanical notes and observations, only very partially gleaned by me; and occupies more than half the volume. The remainder is botanical notes and register of Mosses.

"Very thick Memorandum book containing original 'Journal' from Tarapoto to Banos, with much botanical matter (only skimmed by me). Also copious notes on his Mosses and Hepaticae.

"Besides the seven volumes enumerated, there are the letters received by him (mostly when in South America) from Sir William Hooker, Mr. G. Bentham, Sir Joseph Hooker, Mr. Wm. Mitten, Mr. Miers, Mr. Destringe and M. Emile Bescherelle.

"Rough Notes for the Introduction to his large work on the Hepaticae (never written in English) and a few on other botanical subjects.

"The complete series of letters from R. Spruce to Mr. William Borrer, of Henfield (1843–1848), almost wholly on the critical study of British and European Mosses and Hepaticae."

A copy of "Notes of a Botanist on the Amazon & Andes," by Richard Spruce, largely founded on the above manuscripts, and edited by Alfred Russel Wallace, O.M., F.R.S., has been presented to the Library by the Editor.

New Zealand.—Two reports to the Department of Lands, New Zealand, have been presented to the Royal Botanic Gardens by the author, Dr. L. Cockayne.

One is a Report on a Botanical Survey of the Tongariro National Park, which was created by Act of Parliament in 1894, and the other deals with the Waipoua Kauri Forest reserve. Both reports are of a comprehensive and interesting character and contain a mass of admirably treated botanical information. The photographs with which they are illustrated considerably enhance their value and are deserving of high praise.

These reports together with the previous report on Kapiti Island (*K.B.*, 1908, p. 266) form a fitting tribute to the wisdom of the Minister of Lands, New Zealand, in directing that these surveys should be undertaken and in having placed the work in the hands of Dr. Cockayne.

Trinidad Herbarium List.—A List of the specimens mounted and classified in the herbarium of the Botanical Department, Trinidad, has been compiled by Mr. J. H. Hart, lately Superintendent. From a collection of 3,000 specimens in 1887 the number has increased to about 30,000 in 1908, and besides Trinidad plants includes specimens from Bolivia, Porto Rico, Grenada, &c. It appears that a large number of additions have yet to be arranged and classified, but as it stands the list shows a good representative collection of the flora of Trinidad.

Southern Islands Expedition.—A letter has been addressed to the Editor of the *Kew Bulletin* by the Philosophical Institute of Canterbury, New Zealand, on the subject of the article by Capt. Dorrien Smith in *Kew Bulletin*, No. 6. This letter has been forwarded to Capt. Dorrien-Smith and he has requested us to insert his apologies to the Philosophical Institute in the *Bulletin*.

With regard to the photographs it must be stated, in fairness to Capt. Dorrien-Smith, that the words "taken by" at the end of the Explanation of Plates were inserted without his knowledge, but in the belief that the photographs selected were, as was the case with the majority of the large collection submitted, his own work.

The Editor, The KEW BULLETIN.

DEAR SIR,

As some explanation seems to be necessary, with regard to an article appearing under your issue No. 6, to the Philosophical Institute of Canterbury, I shall be very much obliged if you will insert in your columns my deepest apologies for what under the circumstance would appear a breach of faith on the part of myself, who was a much honoured member of the Southern Islands Expedition organised by them in November last. The author wishes to assure the Council that he had no intention or inclination whatever of infringing their rights when he gave his sanction to the publication of what was originally a private article, and he was quite unaware that the photographs appearing in the article

were the property of the Council. Such an entire misunderstanding on his part, that nothing was to be published either in England or New Zealand regarding the expedition without the Council's sanction, is deeply regretted.

I am, etc.,

A. A. DORRIEN-SMITH,
Captain.

Coagulation of Latex.—In *Der Tropenpflanzer* for November, 1908 (12 Jahrg., Nr. 11, pp. 520–4), D. Sandmann gives an account of a new method of obtaining caoutchouc from latex.

The separation of the caoutchouc is carried out in the following way. Freshly tapped latex, with or without admixture of water, is strained, poured into dishes, and well mixed with a small amount of a liquid preparation of certain acid fluorine-compounds, which bring about slow coagulation, and at the same time destroy all putrefactive germs. The mixture is allowed to stand for some hours, and the rubber, having by this time collected at the surface, can be removed from the dishes, after which it only requires to be freed from water by pressure, and is then ready for transport.

The fluorine-preparation is sold under the name of "Purub," and its use is protected by patents.

It is claimed that this method has much to recommend it, since it is very simple, and has been found to yield rubber of decidedly good quality, equal in value to the best kinds of Para rubber. Hitherto this method has been chiefly applied to the extraction of rubber from the latex of *Hevea*, but, no doubt, similar experiments will shortly be made with the latex of other plants.

List of Botanical Staffs (Appendix IV.): Errata and Addenda.—

Page 111, line 8 from top, *for* *T. W. Main *read* *J. W. Campbell; line 10 from top *for* *J. W. Campbell *read* *F. R. Long.

Page 104, under **Dublin** add—

Trinity College Herbarium :—

Keeper - - - - E. P. Wright, M.D., F.L.S.

Page 106, under **Gold Coast** add—

Director of Agriculture - W. S. D. Tudhope.

Page 110, under **Singapore** add—

Assistant Superintendent *T. W. Main.

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ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

APPENDIX I.—1908.

LIST OF SEEDS OF HARDY HERBACEOUS PLANTS AND OF TREES AND SHRUBS.

The following is a select list of seeds of Hardy Herbaceous Plants and of Hardy Trees and Shrubs which, for the most part, have ripened at Kew during the year 1907. These seeds are available only for exchange with Botanic Gardens, as well as with regular correspondents of Kew. No application, except from remote colonial possessions, can be entertained after the end of February.

HERBACEOUS PLANTS.

Acaena macrostemon.
microphylla.
Novae-Zelandiae.

Achillea Ageratum.
alpina.
macrophylla.
rupestris.
serbica.

Achyrachaena mollis.

Aconitum orientale.
uncinatum.
vulparia.
Wilsoni.

Actaea spicata.
— var. rubra.

Actinomeris squarrosa.

Adesmia muricata.

Adonis aestivalis.

Aethionema cappadocicum.
cordatum.
grandiflorum.
pulchellum.
saxatile.

Agrimonia odorata.
repens.

Agropyron acutum.
junceum.
tenerum.

Agrostis alba.
capillaris.
elegans.
nebulosa.

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Ajuga Chamaepitys.

Allium acuminatum.
albo-pilosum.
atropurpureum.
cardiostemon.
giganteum.
karataviense.
margaritaceum.
narcissiflorum.
odorum.
pulchellum.
Schuberti.
subvillosum.
Suworowi.
zebdanense.

Alonsoa linearis.
Warscewiczii.

Alstroemeria aurantiaca.
haemantha.

Althaea armeniaca.
ficifolia.
kurdica.
pontica.
rosea.
sulphurea.
taurinensis.

Alyssum argenteum.
creticum.
gemonense.
incanum.
podolicum.
rostratum.

Amaranthus caudatus.
Dussii.
polygamus.
retroflexus.
speciosus.

Ambrosia artemisiaefolia.

Amellus annuus.

Amethystea caerulea.

Ammobium alatum.

Ammophila arundinacea.

Amphoricarpus Neumayeri.

Amsinckia angustifolia.

Anacyclus officinarum.

Anaphalis cinnamomea.

Anarrhinum bellidifolium.

Anchusa capensis.
hybrida.
italica.

Androsace lactea.

Anemone apennina.
baldensis.
blanda.
decapetala.
multifida.
parviflora.
pratensis.
Pulsatilla.
— var. lilacina.
rivularis.
sylvestris.
virginiana.

Angelica dahurica.

Anoda hastata.
Wrightii.

Anthericum Liliago.
ramosum.

Anthoxanthum Puelii.

Antirrhinum Asarina.
Orontium.

Apera interrupta.
Spica-Venti.

Aplopappus croceus.

Aquilegia alpina.
canadensis.
chrysantha.
flabellata.
glandulosa.
Kitaibeli.

Arabis alpina.
arenosa.
cenisia.
pumila.

Aralia racemosa.

Arctium intermedium.
majus.
nemorosum.

Arenaria aretioides.
cephalotes.
graminifolia.
grandiflora.
gypsophiloides.
liniflora.
pinifolia.

Argemone hispida.
platyceras.
stenopetala.

Aristida adscensionis.

Armeria canescens.
juncea.
majellensis.
plantaginea.

Arnica Chamissonis.
longifolia.
montana.
Parryi.
sachalinensis.

Arthraxon ciliaris.

Asperella Hystrix.

Asperula azurea.
ciliata.
galioides.

Asphodeline liburnica.

Asphodelus albus.

Aster alpinus.
var. himalaicus.
canescens.
foliaceus.
radula.

Astilbe chinensis.

Astragalus alopecuroides.
boeticus.
chinensis.
danicus.
Echinus.
frigidus.
pentaglottis.

Astrantia Biebersteinii.
neglecta.

Athamanta Matthioli.

Atriplex littoralis.
rosea.
sibirica.

Atropa Belladonna.

Aubrietia gracilis.
Pinardi.

Baeria coronaria.

Baptisia australis.
leucantha.

Barbarea arcuata.

Basella rubra.

Beckmannia erucaeformis.

Bellium minutum.

Beta trigyna.

Bidens frondosa.
grandiflora.
leucantha.

Biserrula Pelecinus.

Biscutella auriculata.
ciliata.
laevigata.

Blumenbachia insignis.
muralis.

Bocconia cordata.
microcarpa.

Borago laxiflora.

Brachycome iberidifolia.

Brachypodium distachyum.
pinnatum.
sylvaticum.

Brassica alba.
campestris.
— var. chinensis
Cheiranthos.
Erucastrum.
juncea.

Briza geniculata.
maxima.
minor.

Brodiaea laxa.

Bromus adoënsis.
albidus.
breviaristatus.
carinatus.
ciliatus.
macrostachys.
marginatus.
maximus.
Porteri.
pumpelianus.
Richardsoni.
rubens.
secalinus.
squarrosus.
Tacna.
Trinii.
unioloides.

Bulbinella Hookeri.

Bunias orientalis.

Buphthalmum salicifolium.

Bupleurum aristatum.
Candollei.
glaucum.

Caccinia strigosa.

Calamagrostis confinis.
epigeios.
varia.

Calamintha grandiflora.
patavina.

Calandrinia grandiflora.
Menziesii.

Calceolaria mexicana.
polyrrhiza.

Callirhoë pedata.

Callistephus hortensis.

Caltha polypetala.

Calystegia sylvatica var. rosea.
sepium var. dahurica.

Camassia Cusickii.
esculenta.
Fraseri.
Leichtlinii.
montana.

Camelina sativa.

Campanula alliariaefolia.
barbata.
bononiensis.
lactiflora.
latiloba.
latifolia.
longistyla.
michauxioides.
phyctidocalyx.
primulaefolia.
punctata.
Steveni.
thyrsoides.

Capsella Heegeri.

Carbenia benedicta.

Cardamine chenopodifolia.
digitata.

Carduus cernuus.
niveus.
tenuiflorus.

Carex arctata.
Buchanani.
depauperata.
paniculata.
pendula.

Carlina acaulis.

Carthamus leucocaulos.

Carum buriacticum.

Catananche lutea.

Cedronella cana.
triphylla.

Celsia Arcturus.

Cenchrus tribuloides.

Cenia turbinata.

Centaurea atropurpurea.
cynaroides.
dealbata.
pulchra.
rupestris.
ruthenica.

Centranthus macrosiphon.
Sibthorpii.

Cephalaria alpina.
tatarica.
transylvanica.

Cerastium Biebersteinii.
tomentosum.

Cerinthe aspera.
major.
retorta.

Chaenostoma foetidum.

Chaerophyllum aromaticum.
aureum.
nodosum.

Charieis heterophylla.

Chelidonium Franchetianum.

Chelone Lyoni.
obliqua.

Chenopodium ambrosoides.
Bonus-Henricus.
urbicum.
virgatum.

Chloris barbata.
elegans.

Chlorogalum pomeridianum.

Chorispora tenella.

Chrysanthemum cinerariae-
folium.
corymbosum.
setabense.
viscosum.

Chrysopogon Gryllus.

Cicer arietinum.

Cimicifuga cordifolia.
racemosa.

Cladium Mariscus.

Clarkia elegans.
pulchella.

Claytonia asarifolia.

Clematis diversifolia.
integrifolia.

Cleonia lusitanica.

Clintonia umbellata.

Clypeola Jouthlaspi.

Cnicus arachnoideus.
canus.
eriophorus.
oleraceus.
syriacus.

Cochlearia officinalis.

Codonopsis ovata.
rotundifolia.

Coix Lacryma-Jobi.

Collinsia bicolor.
verna.

Collomia gilioides.
grandiflora.
linearis.

Commelina coelestis.

Conringia orientalis.

Convolvulus farinosus.
siculus.
tricolor.
undulatus.

Coreopsis auriculata.
coronata.
Drummondi.
grandiflora.
tinctoria.

Coriandrum sativum.

Cornucopiae cucullatum.

Coronilla elegans.

Corydalis cheilanthifolia.
glauca.
racemosa.
rosea.
thalictrifolia.

Cosmos diversifolius.

Crambe hispanica.

Crepis blattarioides.
grandiflora.
rubra.
sibirica.

Crocus asturicus.
aureus.
biflorus var. Weldeni.
— var. Pestallozae.
cancellatus.
— var. mazziaricus.
candidus.
chrysanthus.
Clusii.
Fleischeri.
hadriaticus.
— var. chrysobelonicus.
iridiflorus.
Korolkowi.
laevigatus.
medius.
Olivieri.
pulchellus.
Salzmanni.
Tourneforti.
zonatus.

Cucubalus baccifer.

Cuminum Cyminum.

Cuphea Llavea.
Zimapani.

Cuscuta glomerata.

Cyclamen Coum.
ibericum.
repandum.

Cynoglossum microglochin.
pictum.
Wallichii.

Cynosurus echinatus.

Cyperus vegetus.

Dactylis Aschersoniana.

Danthonia Thomasoni.

Delphinium Ajacis.
Barlowi.
cashmirianum
dyctiocarpum.
elatum.
grandiflorum.
hybridum.
Maackianum.
occidentale.
pictum.
Pylzowi.
speciosum.
— var. glabratum.
— var. turkestanicum.

Deschampsia caespitosa.
calycina.

Dianthus ambiguus.
arenarius.
caesius.
capitatus.
cruentus.
giganteus.
petraeus.
pruinosus.
pungens.
Seguieri.
superbus.
sylvestris.
Waldsteinii.

Digitalis ambigua.
ferruginea.
lutea.

Dipcadi serotinum.

Dipsacus asper.
atratus.
Fullonum.
inermis.
plumosus.

Doronicum Orphanidis.

Dorycnium herbaceum.

Downingia elegans.

Draba altaica.
Athoa.
carinthiaca.
cuspidata.
fladnizensis.
frigida.
grandiflora.
incana.
Kotschyi.
Salomoni.
streptocarpa.

Dracocephalum moldavicum.
peregrinum.
Ruyschiana.
— var. japonicum.

Dracunculus vulgaris.

Dryas octopetala.

Drypis spinosa.

Ecballium Elaterium.

Eccremocarpus scaber.

Echinaria capitata.

Echinodorus ranunculoides.

Echium plantagineum.
rubrum.

Elsholtzia cristata.

Elymus canadensis.
Caput-Medusae.
condensatus.
giganteus.

Emilia flammea.

Encelia calva.

Epilobium Dodonaei.
montanum.
nummularifolium.

Eragrostis elegans.
maxima.

Eremurus Bungei.

Erigeron alpinus.
glabellus.
macranthus.
philadelphicus.
rupestris.

Erinus alpinus.

Erodium Botrys.
chium.
ciconium.
gruinum.
malacoides.
Manescavi.
moschatum.
pelargoniflorum.
romanum.

Eruca sativa.

Eryngium amethystinum.
dichotomum.
giganteum.
maritimum.
Oliverianum.
planum.

Erysimum ochroleucum.
Perofskianum.

Erythronium giganteum.
Hartwegii.
revolutum.

Eschscholzia caespitosa.
californica.

Eucharidium Breweri.
concinnum.

Eupatorium ageratoides.

Euphorbia altissima.
coralloides.

Fedia Cornucopiæ.

Felicia fragilis.
tenella.

Festuca bromoides.
Eskia.
glauca.
Halleri.
heterophylla.
Myuros.
rigida.
tenuiflora.

Foeniculum dulce.
virescens.

Fritillaria askabadensis.
citrina.
pudica.
tenella.
Tuntasia.

Funkia ovata.
Sieboldiana.

Gaillardia aristata.

Galega orientalis.

Galeopsis pyrenaica.
Tetrahit.

Gastridium australe.

Gaudinia fragilis.

Gentiana asclepiadea.
Cruciata.
decumbens.
lutea.
tibetica.

Geranium albanum.
albiflorum.
Endressi.
grandiflorum.
incisum.
nepalense.
nodosum.
palustre.
rivulare.

Gerbera Anandria.
Bellidiastrum.
kunzeana.
nivea.

Geum Heldreichii.
macrophyllum.
montanum.
pyrenaicum.
triflorum.

Gilia androsacea.
capitata.
densiflora.
liniflora.
squarrosa.
tricolor.

Glaucium corniculatum.
flavum.
— var. fulvum.
— var. tricolor.

Glyceria plicata.

Glycine Soja.

Glycyrrhiza echinata.
uralensis.

Grammanthus gentianoides.

Grindelia squarrosa.

Guizotia abyssinica.

Gymnolomia multiflora.

Gypsophila acutifolia.
elegans.
muralis.
Steveni.

Halenia Perrottetii.

Haplocarpha scapos .

Hastingsia alba.

Hebenstreitia tenuifolia.

Hedysarum coronarium.
esculentum.
flexuosum.
microcalyx.
neglectum.

Helenium Bigelovii.

Helianthemum Tuberaria.

Helichrysum bracteatum.
foetidum.
saxatile.

Heliophila amplexicaulis.
crithmifolia.
pendula.

Helipterum Manglesii.
roseum.

Helleborus corsicus.

Hemerocallis Dumortieri.
flava.
Middendorfii.
Sieboldi.
Thunbergii.

Heracleum Mantegazzianum.

Herniaria hirsuta.

Hesperis matronalis.

Heterospermum Xanti.

Heuchera pubescens.

Hibiscus Trionum.

Hieracium amplexicaule.
aurantiacum.
Bornmülleri.
gymnocephalum.
maculatum.
pannosum.
villosum.

Hilaria rigida.

Hippocrepis multisiliquosa.
unisiliquosa.

Holosteum umbellatum.

Hordeum bulbosum.
jubatum.
maritimum.

Hosackia purshiana.

Hunnemannia fumariaefolia.

Hyacinthus amethystinus.
azureus.

Hyoscyamus albus.
aureus.

Hypecoum grandiflorum.
procumbens.

Hypericum hirsutum.
Kotschyanum.
polyphyllum.

Iberis Amara.
pinnata.
tenoreana.

Impatiens fulva.
Noli-tangerre.
scabrida.

Inula macrocephala.
montana.
racemosa.
Royleana.
salicina.
thapsoides.

Ionopsidium acaule.

Iris albo-purpurea.
bracteata.
Clarkei.
Delavayi.
Douglasiana.
ensata.
foetidissima.
— var. citrina.
graminea.
laevigata.
longipetala.
Milesii.
missouriensis.
prismatica.
setosa.
tectorum.
tenax.
unguicularis.
Watsoniana.

Isatis glauca.
tinctoria.
Villarsii.

Isopyrum fumarioides.

Jasonia tuberosa.

Juncus alpinus.
Chamissonis.
tenuis.

Jurinea alata.
ambigua.
spectabilis.

Kniphofia rufa.
Tysoni.

Kochia arenaria.
scoparia.
—var. trichophila.

Koeleria albescens.
phleoides.
setacea.

Lactuca Bourgaei.
hastata.
macrophylla.

Lagascea mollis.

Lagurus ovatus.

Lallemantia canescens.
iberica.
peltata.
royleana.

Lamarckia aurea.

Laserpitium hispidum.
Siler.

Lasthenia glabrata.

Lathyrus angulatus.
Aphaca.
articulatus.
Cicera.
Clymenum.
cyaneus.
filiformis.
luteus.
montanus.
Nissolia.
Ochrus.
polyanthus.
setifolius.
sphaericus.
tingitanus.
undulatus.
variegatus.
venosus.

Lavatera cachemiriana.
thuringiaca.
trimestris.

Layia elegans.
glandulosa.

Lens esculenta.

Leonurus Cardiaca.
sibiricus.
tataricus.

Leontopodium alpinum.

Lepachys columnaris.

Leptosyne maritima.
Stillmanni.

Lepturus cylindricus.

Libertia formosa.
grandiflora.
ixioides.

Ligusticum alatum.
scoticum.
Seguieri.

Lilium concolor var. sinicum.
Kellogii.
Parryi.
tenuifolium.

Limnanthes alba.
Douglasii.

Linaria anticaria.
bipartita.
Broussonetii.
dalmatica.
Elatine.
maroccana.
origanifolia.
reticulata.
saxatilis.
triphylla.
tristis.
viscida.

Lindelofia spectabilis.

Linum capitatum.
flavum.
usitatissimum.

Lithospermum minimum.

Loasa hispida.
lateritia.
vulcanica.

Lobelia sessilifolia.
syphilitica.

Lolium multiflorum.
temulentum.

Lopezia coronata.

Lotus ornithopodioides.
Requienii.
Tetragonolobus.

Lunaria biennis.

Lupinus affinis.
angustifolius.
elegans.
Hartwegii.
micranthus.
nootkatensis.
pubescens.
tricolor.

Luzula albida.
nivea.

Lychnis alpina.
Coeli-rosa.
corsica.
Flos-jovis.
Githago.
Lagascae.
lapponica.

Lythrum hyssopifolia.

Madia dissitiflora.
elegans.
sativa.

Malcomia africana.
Chia.

Malope trifida.

Malva Alcea.
Duriaei.
oxyloba.

Malvastrum limense.

Mandragora officinarum.

Martynia lutea.
proboscidea.

Matricaria Tchihatchewii.

Matthiola tricuspidata.

Meconopsis aculeata.
cambrica.
heterophylla.
Wallichii.

Medicago Echinus.
littoralis.
Helix.
minima.
orbicularis.
turbinata.

Melica altissima.
ciliata.
nutans.
uniflora.

Melilotus alba.

Mentzelia Lindleyi.

Mesembryanthemum pyropeum.

Mimulus Langsdorfii
luteus.

Mirabilis divaricata.
Wrightiana.

Molinia cœrulea.

Molopospermum cicutarium.

Monolepis trifida.

Moricandia arvensis.

Morina longifolia.

Moscharia pinnatifida.

Muscari armeniacum.
comosum.
compactum.
latifolium.
paradoxum.
parviflorum.
polyanthum.
Szovitzianum.

Myagrum perfoliatum.

Myosotis alpestris.
dissitiflora.

Myosuros minimus.

Nardus stricta.

Nemesia pubescens.
strumosa.

Nemophila insignis.
maculata.
Menziesii.

Nepeta Mussini.
nuda.

Neslia paniculata.

Nicandra physaloides.

Nicotiana Langsdorffii.
paniculata.
rustica.
sylvestris.

Nigella damascena.
hispanica.
orientalis.

Nolana prostrata.

Œnanthe pimpinelloides.
silaifolia.

Œnothera nocturna.
pumila.
tenella.

Omphalodes linifolia.

Ononis alopecuroides.
hircina.
Natrix.
rotundifolia.

Onosma albo-roseum.

Ornithopus sativus.

Orobanche amethystea.
elatior.
Hederae.
ramosa.

Ostrowskia magnifica.

Oxyria digyna.

Panicum bulbosum.
capillare.
Crus-galli.
Isachne.
miliaceum.
sanguinale.

Papaver alpinum.
apulum.
arenarium.
Argemone.
commutatum.
glaucum.
laevigatum.
pavoninum.
rupifragum.
somniferum.

Parnassia palustris.

Parochetus communis.

Paspalum dilatatum.
floridanum.

Pelargonium australe.

Pennisetum longistylum.
macrourum.
Ruppellii.

Pentstemon antirrhinoides.
campanulatus.
coeruleus.
confertus.
deustus.
diffusus.
gentianoides.
gracilis.
Hartwegii.
heterophyllus.
ovatus.
pubescens.
secundiflorus.

Petunia nyctaginiflora.

Phacelia tanacetifolia.

Phleum arenarium.
alpinum.

Physalis Alkekengi.
Francheti.
peruviana.

Phlomis tuberosa.
viscosa.

Phnopsis stylosa.

Physochlaina orientalis.

Phyteuma canescens.
Michelii.
nigrum.
orbiculare.
spicatum.

Phytolacca acinosa.
bogotensis.
polyandra.

Picridium tingitanum.

Plantago amplexicaulis.
arenaria.
Candollei.
Coronopus.
Lagopus.
maritima.
maxima.
ovata.
Psyllium.
tibetica.

Platycodon grandiflorum.

Platystemon californicus.

Pleurospermum Golaka.

Plumbago micrantha.

Poa abyssinica.
nevadensis.

Podophyllum Emodi.

Polemonium mexicanum.
pauciflorum.

Polygonum alpinum var. polymorphum.
molle.
orientale.
viviparum.
Weyrichii.

Polypogon littoralis.
maritimus.
monspeliensis.

Polypteris callosa.
texana.

Portulaca grandiflora.

Potentilla arguta.
argyrophylla.
Detommasii.
gelida.
glandulosa.
gracilis.
Griffithii.
hirta.
leuconota.
mollis.
montenegrina.
nepalensis.
recta.
sericea.
tanacetifolia.
Thurberi.
tridentata.

Prenanthes altissima.

Primula denticulata.
— var. cashmiriana.
frondosa.
japonica.
pulverulenta.
rosea.
variabilis.
verticillata.

Prunella grandiflora.
hyssopifolia.

Psoralea macrostachya.
physodes.

Ranunculus asiaticus.
auricomus.
brutius.
falcatus.
trilobus.

Rehmannia angulata.

Reseda virgata.

Rhagadiolus edulis.

Rheum Emodi.
Rhaponticum.
Webbianum.

Rodgersia pinnata.
tabularis.

Roemeria hybrida.

Romulea Bulbocodium.
candida.
Columnae.
ramiflora.
Requienii.

Rudbeckia ampla.
amplexicaulis.
bicolor.
californica.
speciosa.

Rumex alpinus.
limosus.
salicifolius.

Salpiglossis variabilis.

Salsola Kali.
— var. Tragus.

Salvia Aethiopis.
argentea.
Columbariae.
glutinosa.
Horminum.
japonica.
nutans.
Przewalskii.
Schiedeana.
Sclarea.
taraxacifolia.
tiliaefolia.

Sambucus Ebulus.

Saponaria bellidifolia.
calabrica.
ocymoides.

Saussurea albescens.
discolor.

Saxifraga cartilaginea.
cochlearis.
cordifolia.
Cotyledon.

Saxifraga crassifolia.
crustata.
flagellaris.
lingulata.
— var. lantoscana.
Macnabiana.
rotundifolia.
tenella.

Scabiosa Boissieri.
brachiata.
Candolleana.
caucasica.
dalmatica.
gramuntia.
isetensis.
leucophylla.
longifolia.
ochroleuca.
prolifera.
Pterocephala.
pyrenaica.
speciosa.
vestina.

Scilla amethystina.
amoena.
bifolia.
Hohenhackeri.
hispanica.
Lilio-Hyacinthus.
patula.
peruviana.
pratensis.
verna.

Scolymus hispanicus.
maculatus.

Scopolia sinensis.

Scorpiurus vermiculata.

Scrophularia alata.
chrysantha.
vernalis.

Scutellaria altissima.

Secale cereale.
dalmaticum.

Securigera Coronilla.

Selinum serbicum.
vaginatum.

Senecio alpinus.
Clivorum.
Doria.
japonicus.
Ledebouri.
Ligularia.
sibiricus.
tanguticus.

Serratula coronata.

Seseli Hippomarathrum.
Libanotis.
tenuifolium.
tortuosum.

Setaria glauca.
italica.
vulpiseta.

Sidalcea candida.
malvaeflora.
neo-mexicana.

Silene alpestris.
asterias.
ciliata.
clandestina.
colorata.
conoidea.
cretica.
fimbriata.
Fortunei.
fuscata.
glauca.
italica.
juvenalis.
linicola.
longicilia.
monachorum.
noctiflora.
nutans.
odontopetala.
pendula.
quadrifida.
rubella.
saxatilis.
squamigera.
stylosa.
Tanakae.
tatarica.
tenuis.
viridiflora.
Zawadskii.

Silphium scaberrimum.
terebinthinaceum.
trifoliatum.
— var. ternatum.

Silybum eburneum.
Marianum.

Sisymbrium polyceratum.
strictissimum.
tanacetifolium.

Sisyrinchium angustifolium.
chilense.
iridifolium.
striatum.

Specularia falcata.

Spiraea lobata.

Sporobolus asper.
cryptandrus.

Stachys discolor.
græca.
grandiflora.
lanata.
longifolia.

Statice Bonduelli.
sinuata.
Suworowi.

Stipa arundinacea.
Calamagrostis.
gigantea.
papposa.
pennata.
viridula.

Succowia balearica.

Swertia longifolia.

Symphyandra Hofmanni.
pendula.

Symphytum asperrimum.

Synthyris reniformis.

Teesdalia regularis.

Tellima grandiflora.

Teucrium Botrys.
canadensis.
multiflorum.

Thalictrum angustifolium.
calabricum.
purpurascens.
squarrosum.

Thermopsis caroliniana.
fabacea.
montana.

Thlaspi perfoliatum.

Tradescantia congesta.
reflexa.

Trautvetteria palmata.

Tricyrtis latifolia.

Tridax trilobata.

Trifolium agrarium.
alpestre.
glomeratum.
Johnstoni.
leucanthum.
maritimum.
pannonicum.
Perrymondi.
physodes.
resupinatum.
scabrum.
spumosum.

Triglochin palustre.

Trigonella corniculata.
caerulea.
cretica.
Foenum-graecum.
ovalis.
polycerata.
radiata.

Trillium grandiflorum.
ovatum.

Trisetum distichophyllum.
flavescens.

Triticum Aegilops.
amyleum.
dicoccum.
monococcum.
ovatum.
polonicum.

Troximon grandiflorum.

Tulipa Lownei.

Tunica glumacea.

Tyrimnus leucographis.

Urtica pilulifera.
— var. balearica.

Valeriana pyrenaica.

Valerianella Auricula.
dentata.
echinata.
eriocarpa.

Veratrum californicum.
nigrum.

Verbascum Blattaria.
longifolium.
phœniceum.

Verbena bonariensis.
erinoides.
urticaefolia.

Verbesina encelioides.
helianthoides.

Veronica glauca.
incana.
Lyallii.
saxatilis.
virginica.
— var. japonica.

Vesicaria grandiflora.

Vicia atropurpurea.
canescens.
gigantea.
hirsuta.
narbonensis.
pisiformis.
sicula.
sylvatica.
unijuga.

Vincetoxicum fuscatum.
nigrum.
officinale.

Viola arenaria.
cornuta.
persicifolia.
sagittata.
sylvestris.

Volutarella Lippii.
muricata.

Xanthium macrocarpum.
spinosum.

Xanthocephalum gymnospermoides.

Ziziphora tenuior.

Zygadenus elegans.
glaberrimus.
muscitoxicum.

TREES AND SHRUBS.

Those marked with an asterisk were not grown at Kew.

Acanthopanax sessiliflorum.
spinosum.

Acer circinatum.
coriaceum.
Heldreichi.
macrophyllum.
pennsylvanicum.
Trautvetteri.

Ailanthus glandulosa.

Alnus cordifolia.
firma.
incana.
japonica.
viridis.

Amorpha canescens.

Andrachne colchica.

Aplopappus ericoides.

Aralia chinensis.

*Arbutus Menziesii.

*Arctostaphylos Manzanita.
*pungens.
*tomentosa.

Berberis aetnensis
aristata.
concinna.
Darwinii.
sinensis.
stenophylla.
Thunbergi.
Wallichiana.

Betula davurica.
fruticosa.
humilis.
humilis var. Grayi.
— kamtschatica.
lenta.
papyrifera.
ulmifolia.

Bruckenthalia spiculifolia.

Buddleia albiflora.
Hemsleyana.
japonica.
variabilis.

Calycanthus floridus.
occidentalis.

Caragana arborescens.
— var. Redowskii.
aurantiaca.
brevispina.

Carmichaelia australis.
flagelliformis.

Cassinia fulvida.

Ceanothus americanus.
— var. opacus.
Arnoldi.

Celastrus articulatus.

*Celtis glabrata.
occidentalis.

Cephalotaxus drupacea.
Fortuni.

Chimonanthus fragrans.

*Cistus corbariensis.
florentinus.
hirsutus.
laurifolius.
purpureus.
villosus.

Clematis aethusifolia.
— var. latisecta.
Bergeroni.
connata.
crispa.
Flammula.
globosa.
Hendersonii.
parviflora.
Pitcheri.
Viticella.

Clerodendron trichotomum.

Clethra acuminata.

Colutea arborescens.
cruenta.
longialata.

Cornus Amomum.
candidissima.
circinata.
macrophylla.
pubescens.
stolonifera.

Coronilla Emerus.

Cotoneaster affinis.
bacillaris.
frigida.
laxiflora.
Lindleyi.
microphylla.
pannosa.
pekinensis.
Simonsii.
thymifolia.
uniflora.

*Crataegus Arnoldiana.
Carrièrei.
*cibaria.
*coccinoides.
cordata.
Dippeliana.
*gravida.
melanocarpa.
mexicana.
pentagyna.
punctata.
Pyracantha.
sinaica.
succulenta.

*Cupressus Lawsoniana.
thyoides.

Cydonia Maulei.

Cyrilla racemiflora.

Cytisus albus.
biflorus.
capitatus.
leucanthus.
monspessulanus.
nigricans.
purgans.
purpureus.
sessilifolius.

Daboëcia polifolia.

Desmodium viridiflorum

Deutzia corymbosa.
crenata.

Diervilla rivularis.
sessilifolia.
— var. splendens.

*Dirca palustris.

Dorycnium suffruticosum.

Elaeagnus multiflora.
umbellata.

Enkianthus campanulatus.

Escallonia Philippiana.
rubra.

Euonymus latifolius.
oxyphyllus.

Exochorda Alberti.

Fraxinus excelsior var. heterophylla.

Gaultheria procumbens.
Shallon.

Genista aethnensis.
germanica.
hispanica.
pilosa.
radiata.
sagittalis.
virgata.

Halesia hispida.
tetraptera.

Helianthemum formosum.
halimifolium.
polifolium.

Hippophaë rhamnoides.

Hydrangea arborescens.
aspera.
Bretschneideri.
paniculata.
petiolaris.
vestita.

Hymenanthera crassifolia.

Hypericum Androsaemum.
aureum.
*Coris.
densiflorum.
elatum.
hircinum.
inodorum.
lysimachioides.
Moserianum.
patulum var. Henryi.
prolificum.
uralum.

Idesia polycarpa.

Ilex cornuta.
opaca.
verticillata.

Indigofera Gerardiana.
hebepetala.

Jasminum fruticans.
humile.

*Juniperus monosperma.
phoenicea.
*sabinioides.

Kalmia angustifolia.
glauca.
latifolia.

Laburnum alpinum.
Parksii.
Vossii.

*Larix leptolepis.

Ledum palustre.

Lespedeza bicolor.

Leycesteria formosa.

Ligustrum medium.

*Liriodendron Tulipifera.

Lonicera alpigena.
depressa.
involucrata.
Maximowiczii.
minutiflora.
Morrowii.
muscaviensis.
nigra.
oblongifolia.
pileata.
pyrenaica.
Regeliana.
segreziensis.
Sullivanti.
translucens.
Xylosteum.

Lupinus arboreus.

Lycium pallidum.

*Magnolia Kobus.

Metaplexis Stauntoni.

Microglossa albescens.

Myrica cerifera.

Neillia amurensis.
capitata.
opulifolia.
Torreyi.

Notospartium Carmichaeliae.

Nuttallia cerasiformis.

*Nyssa aquatica.

Olearia Haastii.

Ononis arragonensis.
fruticosa.
rotundifolia.

Pernettya mucronata.

Petteria ramentacea.

Philadelphus acuminatus.
coronarius.
Gordonianus.
Lewisii.

Picrasma quassioides.

Pieris japonica.

*Pinus muricata.
*Parryana.

*Platanus cuneata.
orientalis.

Potentilla Friedrichseni.
fruticosa.

Prunus acida var. semperflorens.
*australis.
Besseyi.
cornuta.
*hortulana.
japonica.
*maritima.
Maximowiczii.
*orthosepala.

Prunus acida var. *pendula.
*pensylvanica.
*Pseudo-cerasus.
*siberica.
*virginiana.
*Watsoni.

Ptelea trifoliata.

Pyrus arbutifolia.
nigra.
Ringo.

Rhamnus carniolica.
crenata.
libanotica.
spathulifolia.

Rhododendron racemosum.
Rhodora.

Rhodotypus kerrioides.

Rhus aromatica.
*glabra.
*Osbeckii.

Ribes alpinum.
*curvatum.
mogollonicum.

Rosa lucida alba.

Rubus biflorus.
calycinus.
crataegifolius.
deliciosus.
leucodermis.
melanolasius.
Millspaughii.
neglectus.
nutkanus.
occidentalis.
parvifolius.
phoenicolasius.
spectabilis.
strigosus.
xanthocarpus.

Ruta graveolens.
montana.

Sambucus canadensis var
maxima.
melanocarpa.

Schizandra chinensis.

*Smilax laurifolia.

Sophora viciifolia.

Spartium junceum.

Spiraea Aitchisoni.
bullata.
concinna.
Douglasi.
expansa.
Foxii.
Lindleyana.
Nobleana.
pachystachys.
tomentosa.

Staphylea colchica.
Coulombieri.
pinnata.

Stephanandra Tanakae.

Styrax japonica.

Symphoricarpus Heyeri.
mollis.
occidentalis.
racemosus.
rotundifolius.

Symplocos crataegoides.

Thuya japonica.
orientalis.

*Tilia cordata.
*Michauxi.

Vaccinium corymbosum.
hirsutum.
padifolium.

Viburnum dentatum.
dilatatum.
Lantana.
molle.
phlebotrichum.
Sargenti.

*Zanthoxylum alatum.
Bungei.

Zenobia speciosa.
— var. pulverulenta.

ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

APPENDIX II.—1908.

NOTE.

In the preface to the *Catalogue of the Library of the Royal Botanic Gardens*, which was issued as Volume III. of the *Additional Series* of the *Kew Bulletin*, it was stated that annual lists of future additions would be published in the *Bulletin*.

The present instalment contains the additions made to the Library by gift or purchase during the year 1907, with the exception of such current periodicals and annuals as continue sets already catalogued.

Like the Catalogue, the List is printed on one side of the page, to allow of its being cut up. It is probable that many persons and institutions will make the Kew Catalogue the basis of their own, and will use the lists of additions to supply printed slips for fresh titles.

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ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

APPENDIX III.—1908.

NEW GARDEN PLANTS OF THE YEAR 1907.

The number of garden plants annually described in botanical and horticultural publications, both English and foreign, is now so considerable that it has been thought desirable to publish a complete list of them in the *Kew Bulletin* each year. The following list comprises all the new introductions recorded during 1907. These lists are indispensable to the maintenance of a correct nomenclature, especially in the smaller botanical establishments in correspondence with Kew, which are, as a rule, only scantily provided with horticultural periodicals. Such a list will also afford information respecting new plants under cultivation at this establishment, many of which will be distributed from it in the regular course of exchange with other botanic gardens.

The present list includes not only plants brought into cultivation for the first time during 1907, but the most noteworthy of those which have been re-introduced after being lost from cultivation. Other plants included in the list may have been in gardens for several years, but either were not described or their names had not been authenticated until recently.

In addition to species and well-marked varieties, hybrids, whether introduced or of garden origin, have been included where they have been described with formal botanical names. Mere cultural forms of well-known garden plants are omitted, for obvious reasons.

In every case the plant is cited under its published name, although some of the names are doubtfully correct. Where, however, a correction has appeared desirable, this is made.

The name of the person in whose collection the plant was first noticed or described is given where known.

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An asterisk is prefixed to all those plants of which examples are in cultivation at Kew.

The publications from which this list is compiled, with the abbreviations used to indicate them, are as follows :—*B. H. B.*—Bulletin de l'Herbier Boissier. *B. K.*—Guerke, Blühende Kakteen. *B. M.*—Botanical Magazine. *B. M. H. N.*—Bulletin du Muséum d'Histoire Naturelle, Paris. *B. P.*—Bollettino del R. Orto Botanico di Palermo. *B. S. B. F.*—Bulletin de la Société Botanique de France. *B. S. D. F.*—Bulletin de la Société Dendrologique de France. *B. T. O.*—Bullettino della R. Società Toscana di Orticultura. *Gard.*—The Garden. *G. C.*—Gardeners' Chronicle. *Gfl.*—Gartenflora. *G. M.*—Gardeners' Magazine. *G. W.*—Gardening World. *Henk. Nymph.*—F. Henkel, Das Buch der Nymphaeaceen. *I. S. H. T.*—Icones Selectæ Horti Thenensis. *Jard.*—Le Jardin. *J. of H.*—Journal of Horticulture. *J. H. F.*—Journal de la Société Nationale d'Horticulture de France. *J. R. H. S.*—Journal of the Royal Horticultural Society. *K. B.*—Bulletin of Miscellaneous Information, Royal Botanic Gardens, Kew. *Lemoine Cat.*—Lemoine, Catalogue. *M. D. G.*—Mitteilungen der Deutschen Dendrologischen Gesellschaft. *M. K.*—Monatsschrift für Kakteenkunde. *N. B.*—Notizblatt des Königl. botanischen Gartens und Museums zu Berlin. *O. G. Z.*—Oesterreichische Garten-Zeitung. *O. R.*—Orchid Review. *Orch.*—Orchis. *R. H.*—Revue Horticole. *R. H. B.*—Revue de l'Horticulture Belge. *Sargent, T. & S.*—Sargent, Trees and Shrubs. *S. M. C.*—Smithsonian Miscellaneous Collections. *Späth Cat.*—L. Späth, General Nursery Catalogue. *T. H.*—La Tribune Horticole. *Veitch Nov.*—J. Veitch & Sons, List of Novelties.

The abbreviations in the descriptions of the plants are :—*diam.*—Diameter. *ft.*—Foot or Feet. *G.*—Greenhouse. *H.*—Hardy. *H. H.*—Half-hardy. *in.*—Inches. *S.*—Stove.

Abies concolor aurea. (*M. D. G.* 1906, 144.) Coniferae. H. The young shoots in May are golden-yellow, afterwards gradually becoming silver-gray. (C. Ansorge, Klein Flottbek, Hamburg.)

Abies concolor brevifolia. (*M. D. G.* 1906, 144.) H. The leaves are short and obtuse, and twice as broad as in the typical form. (C. Ansorge, Klein Flottbek, Hamburg.)

Acer Heldreichii purpuratum. (*M. D. G.* 1906, 212.) Sapindaceae. H. Leaves red beneath. (Fritz Graf von Schwerin, Wendisch-Wilmersdorf, Germany.)

***Aconitum gymnandrum.** (*B. M.* t. 8113.) Ranunculaceae. H. An annual with an erect stem reaching a height of 3 ft. Leaves usually ¾-2 in. long, 1-1½ in. broad, deeply divided, with narrow acute lobes. Flowers in a raceme or panicle. Upper sepal helmet-shaped, narrow, green except the coloured margins; lateral violet to deep blue, spreading, clawed. Tibet and West China. (Kew.)

***Aconitum Napellus** var. **eminens.** (*B. M.* t. 8152.) H. A very tall-growing variety, reaching a height of 9 ft. or more. The flowers are more gaping than in the type, and the helmet taller. Rhenish Prussia. (O. Stapf.)

Aerides Duquesnei. (*J. H. F.* 1906, 777.) Orchidaceae. S. Flowers white dotted with rose. Native country not stated. (A. Régnier, Fontenay-sous-Bois, Seine, France.)

Aeschynanthus macrocalyx. (*N. B.* iv. 314, t. 1.) Gesneraceae. S. A scandent epiphyte with slender terete branches. Leaves opposite, shortly stalked, fleshy, oblong, 4-5 in. long, 1-1½ in. broad, acuminate. Flowers axillary, solitary, shortly stalked. Calyx about 1¾ in. long, with narrowly lanceolate acuminate

lobes. Corolla exserted, cylindric-funnel-shaped, slightly curved and enlarged in the upper part, scarlet, with dark purple nerves and spots. Siam. (Berlin B. G.)

Aesculus Pavia roseo-variegata. (*M. D. G.* 1906, 211.) Sapindaceae. H. Young leaves rose-red, with green blotches. The reddish colour later on changes to yellow, and finally the whole leaf becomes green. (R. Behnsch, Dürrgoy, Breslau.)

***Agapetes speciosa.** (*G. C.* 1907, xli. 224, 230, f. 101; *G. M.* 1907, 292.) Ericaceae. G. A new species allied to *C. setigera* var. *Roylei*, differing in having larger leaves auricled at the base, larger flowers, and shorter deltoid calyx-lobes. Leaves clustered at the end of each year's shoot, ovate-oblong, 3½–4 in. long, 1½–2 in. broad. Corolla deep crimson, tubular, ventricose in the middle, 1½–1¾ in. long, 7½ lin. broad in the middle, 5-ribbed. Native country unknown, probably Burma. (J. T. Bennett-Poë.)

Agave parrasana. (*N. B.* iv. 250.) Amaryllidaceae. G. A new species with a very distinct habit. Leaves about 30, in a dense rosette, erect from a very fleshy base, smooth, 3½ in. broad at the base, nearly 4 in. broad at the middle, almost ovate in the upper part, deeply concave above, convex beneath, with a stout terminal spine; margins at the base entire or with small or minute prickles, in the upper part furnished with stout hooked or variously bent ones. Mexico. (La Mortola.)

***Agave Watsoni.** (*K. B.* 1907, 322.) G. A new species allied to *A. horrida*, but it is distinguished from that species and others of the same group by the extremely narrow border of the leaf. The leaves are 15–20 in number, narrowly oblong-lanceolate, about 20 in. long, with straight or slightly hooked marginal spines about 2½ lin. long and ¾ in. apart. Scape nearly 18 feet high. Probably Central America. (Kew.)

Ailantus Giraldii. (*B. S. D. F.* 1907, 191, ff.) Simarubaceae. H. Near *A. glandulosa*, but the leaves are longer with more numerous narrower long-acuminate leaflets, set much more closely together, and the almost flat fruits are larger. Shensi and Szechuen, China. (Barbier & Co., Orleans; M. L. de Vilmorin, Les Barres, France.)

Ailantus sutchuenensis. (*B. S. D. F.* 1907, 192, ff.) H. Closely allied to *A. glandulosa*. It differs in having the leaflets apparently glabrous, not ciliate, narrower at the base, and furnished with spreading teeth. Inflorescence larger, 12–16 in. long, glabrous. Fruits nearly flat, larger, up to 2½ in. long and nearly ½ in. broad. Central China. (M. L. de Vilmorin, Les Barres, France.)

Alluaudia sp. (*R. H.* 1907, 493, f. 165.) Didiereaceae. S. The genus closely resembles Didierea, which was included in the List of 1898. It consists of a few species of small trees with tufted spiny branches, quite destitute of leaves except in the young state, and bearing cymes of inconspicuous flowers. The name of the species in cultivation is not recorded. Madagascar. (Paris B. G.)

Aloe pallidiflora. (*B. M.* t. 8122.) Liliaceae. G. A stemless plant. Leaves in a dense rosette, linear-lanceolate, about 14 in. long, 2½–3 in. broad, dull green above and marbled with long whitish marks, armed on the margins with sharp spines up to ¼ in. long. Inflorescence 2½–4 ft. high, branched. Flowers pale flesh-colour, yellowish inside, 1¼ in. long; tube slightly constricted above the ovary, curved near the throat. South Africa? (Sir T. Hanbury, La Mortola.)

Amomum unifolium. (*B. S. B. F.* 1907, 403.) Scitamineae. S. A herb about 1¾ ft. high. Leaf 1 (rarely 2), ovate, stalked, 9 in. long, about 3 in. broad, abruptly acute, glabrous and glaucescent. Scape none or short. Spike half-immersed in the soil, ovate, 1¼ in. long, rose. Calyx spathe-like, rose. Corolla-tube 1¾ in. long, glabrous; lobes alternately equal, ovate, obtuse, ¾ in. long, ¼ in. broad. Indo-China. (Paris B. G.)

***Ampelopsis Lowi.** (*G. C.* 1907, xlii. 253; *Gard.* 1907, lxxi. 516, f.; *R. H. B.* 1907, 388, f.) Ampelidaceae. H. Raised from seed of *A. Veitchii*. It is more slender in habit than that species. Leaves somewhat cordate, deeply lobed, dark purple in autumn; lobes usually 7, acute. (H. Low & Co.) [*Vitis inconstans Lowi*; G. M. 1907, 718, 726, f.; G. W. 1907, 698.]

***Ampelopsis Saint-Paulii.** (*R. H.* 1907, 567.) H. A vigorous-growing species, covered on the ends of the branches and on the young leaves with

a velvety pubescence. Tendrils as in *Vitis inconstans*. Leaves long-stalked, with 5 long-stalked elliptic leaflets 8 in. long and 3 in. broad, long-acuminate, dark green and glabrous above, paler and pubescent on the nerves beneath. Inflorescence very large (about 6 in. long), pyramidal, loose. Probably native of North America. [Syn. *Parthenocissus Saint-Paulii*, Koehne & Graebn. in *Gfl.* 1900, 250, 283. = *Vitis*.]

***Ancistrochilus Rothschildianus.** (*G. C.* 1907, xli. 51, ff. 24, 25.) Orchidaceae. S. A new species differing from *A. Thomsonianus* in being larger, with rather more fleshy leaves and flowers, in having broader sepals, the two lower being distinctly connivent, and a shorter front lobe to the lip, which has the side lobes heavily tinged with sepia-brown, instead of being spotted. Nigeria. (Hon. W. Rothschild.)

***Anemone Bungeana.** (*Gard.* 1907, lxxi. 214.) Ranunculaceae. H. A distinct species similar in habit to *A. Pulsatilla*, with the same finely-divided leaves, but the segments are not so long. Flowers golden-yellow. Siberia. (Kew.)

Anemone elongata. (*G. C.* 1907, xlii. 127.) H. Similar to *A. sylvestris* in habit and foliage, but it is much less beautiful. The flowering-stems reach a height of about 1¾ ft., and the erect flowers are scarcely 1 in. across, dull greenish white, with bright green anthers. Himalaya. (S. Arnott.) [An old garden plant re-introduced.]

***Anemone magellanica.** (*Gard.* 1907, lxxi. 77.) H. A pretty but not showy species. Leaves prostrate, deeply lobed, slightly hairy. Flowers yellow, 1 in. across, raised slightly above the leaves. Straits of Magellan. [= *A. multifida*, Poir.]

***Angraecum Buyssoni.** (*G. M.* 1907, 885; *G. C.* 1907, xlii. 381.) Orchidaceae. S. A very strong-growing species resembling *A. articulatum*. Stems elongated, with stiff green leaves in 2 rows. Flowers moderately large, pure white, with long slightly brown spurs. Madagascar. (Charlesworth & Co.) [See *L'Orchidophile*, 1887, 281, and 1891, 282. Apparently first introduced into Europe in 1887, when it was figured and described as *A. du Buyssonii*.]

Angraecum Scheffleri. (*Orch.* i. 70.) S. Plant scarcely 8 in. high. Leaves amplexicaul, about 3½ in. long and ¾ in. broad, reddish brown on the underside when young, greener, with transparent reddish dots above. Racemes about 6 in. long, densely flowered; rhachis reddish brown with minute sessile bracts of a paler colour. Flowers, excluding the spur, 2½–3 in. long, reddish brown; spur about as long again. German East Africa. (Berlin B. G.)

Angraecum Scheffleri var. **virens.** (*Orch.* i. 70.) S. Differs from the type in having all the vegetative parts green. German East Africa. (Berlin B. G.)

Angulocaste Bievreanae. (*T. H.* 1907, ii. 516, t. 57; *R. H.* 1907, 438.) Orchidaceae. G. A garden hybrid between *Anguloa Ruckeri* and *Lycaste Skinneri*. (Château Royal, Laeken, Belgium.)

Anthurium Andreanum Gameri. (*R. H.* 1907, 30) Araceae. S. Spathe rounded, about 9 in. long, 8 in. broad, strongly corrugated, very bright red, shining; spadix small, incurved, yellow at the apex. (R. Jarry-Desloges, Paris.)

Araucaria excelsa virgata. (*M. D. G.* 1906, 193.) Coniferae. G. A form in which the primary branches have no secondary branches or only short ones. (Observed in a garden in Palermo, Sicily.)

***Arctostaphylos Manzanita.** (*B. M.* t. 8128.) Ericaceae. H. A shrub or tree, up to about 30 ft. high. Leaves ovate or elliptic-ovate, 1½–1¾ in. long, ⅔–1½ in. broad, obtuse or acute, coriaceous; petiole up to ½ in. long. Flowers many, in a short ovoid or corymbose panicle. Corolla urceolate, about ¼ in. long, white or pinkish. California. (Kew.)

Astilbe. (*Lemoine Cat.* n. 167, iii.; *R. H.* 1907, 535; *Jard.* 1907, 371.) Saxifragaceae. H. The following garden hybrids, obtained by crossing the hybrids between *A. chinensis* and *A. Lemoinei* with *A. Davidii*, are described: *A. carminea*, *A. rubella*, and *A. rutilans*. They have rose or rose-carmine flowers, and differ slightly from one another in the size and form of the panicles. (V. Lemoine & Son, Nancy.)

*Begonia Bertini nana. (*Lemoine Cat.* n. 165, 9.) Begoniaceae. G. A dwarf compact variety with large reddish flowers. (V. Lemoine & Son, Nancy.)

*Begonia dichroa. (*O. G. Z.* 1907, 418.) G. A new shrubby species. Stem erect, freely branched from the base. Leaves elongate-oval, slightly undulate on the margin, sharply acuminate, shining green, dotted and blotched with white, those developed later entirely dark green. Flowers in large axillary fascicles, bright salmon-orange. Fruits whitish rose, winged. Brazil. (Haage & Schmidt, Erfurt.)

*Begonia incomparabilis. (*R. H. B.* 1907, 60, t.) G. A garden hybrid between *B. socotrana* and a garden variety of the tuberous-rooted section. (J. Veitch & Sons.)

Begonia Pearcei × Baumanni. (*Lemoine Cat.* n. 165, 10.) G. A garden hybrid. (V. Lemoine & Son, Nancy.)

Berberis Bretschneideri. (*Sargent, T. & S.*, ii. 21, t. 110.) Berberidaceae. H. An erect shrub 6–10 ft. high, with dark red-brown terete one-year-old branches producing prominent floriferous spurs. Spines usually simple, scarcely ½ in. long. Leaves deciduous, obovate-oblong, 1¾–2½ in. long, ¾–1¼ in. broad, densely toothed (the teeth bearing long bristles pointing forward), shortly stalked, brightly coloured in autumn. Flowers pale yellow, about ⅓ in. across, in short pendent racemes. Fruit oblong, purplish, scarcely ½ in. long. North China. (Arnold Arboretum.)

*Berberis Wilsonae. (*G. C.* 1907, xlii. 284, 372, f. 153; *Gard.* 1907, lxxi. 237, 541, f.; *J. of H.* 1907, lv. 425, f.) H. A dwarf much-branched shrub densely clothed with leaves about ½ in. long, which in the autumn become a beautiful crimson. Spines nearly 1 in. long. Flowers rich golden. Fruits nearly round, coral-red, shining. Western China. (J. Veitch & Sons.)

*Bigelovia graveolens. (*B. M.* t. 8155.) Compositae. H. A shrub 6–8 ft. high. Stem much branched upwards; flowering branches corymbose, pendulous, tomentose, white. Leaves alternate, crowded, linear, 1–3 in. long, acute. Flower-heads very numerous, shortly stalked, 5-flowered, corymbosely arranged. Flowers yellow, all tubular. North America. (Kew.)

*Blepharocalyx spiraeoides. (*B. M.* t. 8123.) Myrtaceae. G. A new species. It is a much-branched free-flowering shrub reaching a height of 9 ft. Leaves lanceolate-linear, ½–¾ in. long, 1/12–⅜ in. broad, very shortly stalked. Flowers small, pale yellow, in dense terminal panicles. Petals 4, broadly elliptic, ⅛ in. long. Brazil. (Kew.) [Previously known in gardens under the name of *Eugenia myriophylla.*]

Brasso-cattleya Alexanderi. (*O. R.* 1907, 125.) Orchidaceae. S. A garden hybrid between *Cattleya citrina* and *Brassavola Digbyana.* (G. L. Holford.)

Brasso-cattleya Hyeae. (*O. R.* 1907, 113, f. 12.) S. A garden hybrid between *Cattleya Harrisoniana* and *Brassavola Digbyana.* (G. L. Holford.)

Brasso-cattleya Thorntonii. (*G. C.* 1907, xli. 413.) A garden hybrid between *Brassavola Digbyana* and *Cattleya Gaskelliana.* (J. Chamberlain.)

Brasso-laelia Jessopii. (*O. R.* 1907, 191.) Orchidaceae. G. A garden hybrid between *Laelia xanthina* and *Brassavola Digbyana.* (G. M. Jessop.)

Brasso-laelia Thwaitesii. (*O. R.* 1907, 264.) G. A garden hybrid between *Laelia grandiflora* and *Brassavola Digbyana.* (R. G. Thwaites.)

Brasso-laelia westfieldiensis. (*O. R.* 1907, 52.) G. A garden hybrid between *Brassavola glauca* and *Laelia flava.* (F. Wellesley.)

*Bulbophyllum Binnendijkii. (*G. C.* 1907, xlii. 161.) Orchidaceae. S. Allied to *B. Ericssonii* from which it differs in having a rigid upright dorsal sepal, marked, as well as the other segments, with larger purple spots, and in the darker colour of the lip. Java. (F. Sander & Sons.)

Bulbophyllum dichromum. (*K. B.* 1907, 128; *B. M.* t. 8160.) S. A new species allied to *B. fuscopurpureum.* An epiphytic herb, with a stout woody rhizome. Pseudobulbs ovoid-oblong, about 2 in. long, 1-leaved. Leaf oblong, about 6 in. long. Scape

suberect, 9–10 in. long. Raceme lax, about 12-flowered. Flowers conspicuous, rather large, deep yellow, with a dark purple lip. Annam. (Glasnevin B. G.)

Bulbophyllum fuscopurpureum. (*O. R.* 1907, 188.) S. Rhizome stout, woody. Pseudobulbs yellowish, tetragonal, 1-leaved. Leaves shortly stalked, oblong, 3–4 in. long. Scapes about 6 in. long, 6- or 7-flowered at the apex. Flowers about 1 in. across, dull reddish brown, darker on the lip. Petals about ½ in. long, broadly triangular at the base, with a filament-like extension clubbed at the apex. Lip with a pair of curved basal side-lobes. Southern India. (J. O'Brien.)

Bulbophyllum galbinum. (*G. C.* 1907, xlii. 42, f. 14.) S. Very closely related to *B. Reinwardtii*, but this species has a much narrower lip, and the sepals and petals have a greener ground colour. The flowers of *B. galbinum* are yellow, with reddish lines and crimson dots. Perak. (Lord Rothschild.)

Bulbophyllum inunctum. (*O. R.* 1907, 22.) S. Flowers larger than in B. Lobbii, with the sepals longer and densely dotted with purple on a light ground. Petals long and drooping, bearing a few purple stripes. Borneo. (Buitenzorg B. G.)

Bulbophyllum tridentatum. (*K. B.* 1907, 128.) S. A new species near *B. mandibulare*. Leaves elliptic-oblong, 6 in. long, about 1 in. broad; petiole 1 in. long. Scape 1–1¾ in. long, 2- or 3-flowered. Sepals 1–2 in. long, dull yellowish green, spotted with dull purple. Petals ½ in. long, coloured like the sepals. Lip fleshy, recurved, acute, about ½ in. long, light brown, suffused with purple on the sides and apex. Column green, with 3-toothed arms. British New Guinea. (F. Sander & Sons.)

Cactus Maxonii. (*S. M. C.* 1. 63, t. 6.) Cactaceae. G. Stem broadly cone-shaped or cylindrical, 4–6 in. high, crowned with a mass of white wool and brown bristles, broadly 11–15-ribbed. Spines usually 9, ½–¾ in. long, pale red or rose-coloured with a whitish bloom, the radial spreading or recurved, and the 1 or sometimes 2 central ones shorter and standing nearly at right angles to the rib. Flowers small, rose-coloured. Guatemala. (Washington B. G.)

***Caesalpinia vernalis.** (*B. M.* t. 8132.) Leguminosae. G. A tall climbing prickly shrub. Leaves bipinnate, with 9–12 pairs of pinnules; pinnules ovate, ½–1 in. long. Flowers in racemes about 6 in. long. Petals ovate, lemon-yellow, the uppermost one smaller than the others and marked with a scarlet blotch. China. (Kew.)

Calanthe burmanica. (*K. B.* 1907, 129.) Orchidaceae. S. Leaves elliptic-lanceolate, acuminate, stalked; blade 8–10 in. long, 1¼–2¼ in. broad. Scape erect, about 18 in. high. Raceme 4 in. long, many-flowered. Flowers mauve-purple, with a yellow crest. Sepals elliptic-ovate, about ½ in. long. Petals elliptic or elliptic-lanceolate, 5–6 lin. long. Lip deeply 3-lobed, adnate to the column, 7–8 lin. long. Burma. (Glasnevin B. G.)

***Calliandra portoricensis** var. **major.** (*B. M.* t. 8129.) Leguminosae. G. A shrub or small tree, with bipinnate leaves and large dense heads of flowers, which are conspicuous on account of the very numerous long pure white stamens. It differs from the type in having deltoid calyx-lobes and longer stamens. Central America. (Kew.)

***Campanula incurva.** (*J. R. H. S.* xxxii. 205.) Campanulaceae. H. A perennial herb with a simple ascending stem 1 ft. high or more. Leaves stalked, cordate, white, downy, crenate, much rounded at the apex, 2–3 in. long and broad. Calyx-lobes ovate-acuminate, ½ in. long, ¼ in. broad. Corolla enlarged-campanulate, pale blue, 1½ in. long. Greece. [= *C. Leutweinii*, Heldr.]

***Campanula Kolenatiana.** (*J. R. H. S.* xxxii. 207.) H. A perennial many-stemmed herb, up to about 9 in. high. Leaves chiefly radical, ovate, about 1 in. long, on long winged petioles. Flowers in a long-stalked raceme, broadly campanulate-funnel-shaped, bluish violet, 1 in. long, hairy inside. Caucasus.

Campanula Medium imperialis. (*Gn.* 1907, 659; *T. H.* 1907, ii. 514.) H. An exceptionally floriferous variety or possibly a hybrid. (Pape & Bergmann, Quedlinburg, Germany.)

***Campanula petraea.** (*G. C.* 1907, xlii. 197, f. 84.) H. A biennial herb. Stem ascending, angular, 6–12 in.

high, covered with grey hispid hairs. Lower leaves elongated, lanceolate-oblong, narrowed to the base, toothed; upper ovate, sessile. Flowers small, pale yellow, in a dense terminal head and in numerous almost sessile smaller axillary heads. Northern Italy. (W. E. Gumbleton.)

Campanula rotundifolia var. **alaskana**. (*G. C.* 1907, xlii. 126.) H. Somewhat dwarfer than the variety *pallida*, with large flowers of much the same shade of blue. (S. Arnott.)

Caragana arborescens forma **Lorbergi**. (*M. D. G.* 1906, 61.) Leguminosae. H. Leaflets only ½–1 lin. or occasionally 2 lin. broad. Standard much narrower than in the type, sometimes with a tooth about ½ lin. long in the middle of the margin.

***Caralluma Nebrownii**. (*N. B.* iv. 249.) Asclepiadaceae. G. Branches robust, erect or ascending, 4-angled, glabrous, 6–7 in. long, about 1¾ in. across; angles flattened, large-toothed, deeply sinuate between the teeth, green or glaucescent, densely spotted with dull purple. Flowers about 13, subumbellate. Pedicels 2½–3 in. long. Corolla about 2½ in. across, deeply 5-lobed; lobes ovate-lanceolate, acute, with purple club-shaped hairs on the margin. German South-West Africa. (La Mortola.)

Catalpa bignonioides var. **Koehnei**. (*B. S. D. F.* 1907, 206.) Bignoniaceae. H. Leaves pallid, golden, the middle of the limb with irregular angular green blotches. (Simon-Louis frères, Plantières, near Metz.)

***Catalpa Bungei**. (*K. B.* 1907, 102.) H. A handsome tree 20–30 ft. high. Leaves relatively rather small, ovate-acuminate, 1½–7½ in. long, up to 4½ in. broad, truncate or cuneate at the base, often coarsely 5- or 6-toothed each side, sometimes entire. Inflorescence corymbose, 3–12-flowered. Corolla purple and white, 1½ in. long and broad. The plant frequently grown as *C. Bungei* is *C. Kaempferi* or a dwarf variety of *C. bignonioides*. China. (Kew.)

***Catalpa Duclouxii**. (*B. S. D. F.* 1807, 201, f.) H. A new species remarkable in having rose-coloured flowers. Leaves deltoid-cordate, entire, glabrous. Inflorescence corymb-shaped, 6–15-flowered or more. (L. A. Dode, Paris.)

Catalpa Galleana. (*B. S. D. F.* 1907, 205, f.) H. A garden hybrid between *C. Kaempferi* and possibly *C. cordifolia*. (E. Gallé, Nancy.)

Catalpa Henryi. (*B. S. D. F.* 1907, 199, f.) H. A tree with large deltoid leaves, cordate at the base, acuminate, entire or sometimes with a single lobe, rarely tricuspidate, the younger puberulous both sides, the older glabrescent beneath. Inflorescence corymb-like. Flowers numerous, small, as in *C. Kaempferi*. Seeds small, brown. China and Japan. (M. L. de Vilmorin, Les Barres, France.)

Catalpa heterophylla. (*B. S. D. F.* 1907, 203, f.) H. Very near *C. Bungei*, but the inflorescence consists of fewer flowers (3–5 instead of 4–12), and the buds are glabrous, not pubescent at the base. The odour of the leaves is not so fetid, and the masses of the glands are red-brown instead of green. North China. (M. L. de Vilmorin, Les Barres, France.) [Syn. *C. Bungei* var. *heterophylla*, C. A. Meyer.]

Catalpa japonica. (*B. S. D. F.* 1907, 200, f.) H. A new species differing from *C. Kaempferi* in having less lobed leaves, and a narrower compact pyramidal inflorescence due to the shortness of the lower secondary axes, which are also markedly slender. The flowers are of a purer white, and are fragrant. Japan. (Simon-Louis frères, Plantières, near Metz.)

***Catalpa Teasiana**. (*B. S. D. F.* 1907, 205, f.) H. A garden hybrid between *C. Kaempferi* and probably *C. cordifolia*. See *Garden and Forest*, 1889, 303, f.

Catasetum Rhamphastos. (*Orch.* ii. 25.) Orchidaceae. S. A new species in habit and size resembling *C. tabulare*. Raceme few-flowered, up to 10 in. long, with a few small triangular bracts. Flowers about 4 in. across. Sepals oblong-lanceolate, acute, pale green, obscurely rose-dotted, about 1¾ in. long, 4 lin. broad. Petals oblong, acute, about the same size as the sepals, pale green. Lip pale green, oblong, 1¾ in. long, 7½ lin. broad, with a callus on the disk 1¼ in. long. Andes of Colombia. (O. Beyrodt, Marienfelde, Berlin.)

Cattleya Armstrongiae. (*G. C.* 1907, xlii 190; *O. R.* 1907, 307.) Orchidaceae. G. A garden hybrid between *C. Hardyana* and *C. Loddigesii violacea.* (Armstrong & Brown.)

Cattleya bahiensis. (*O. R.* 1907, 279.) S. A natural hybrid between *C. velutina* and *C. Warneri.* (Marquis de Wavrin, Château de Ronsele, Ghent.) [= *C.* × *spectabilis*; *O. R.* 1907, 316.]

Cattleya Castraeana. (*G. C.* 1907, xlii. 221; *O. R.* 1907, 309.) A garden hybrid between *C. Loddigesii* and *C. Hardyana.* (F. Sander and Sons.)

Cattleya Frankeana. (*O. R.* 1907, 280.) S. A natural hybrid apparently between *C. velutina* and *C. Schilleriana.* (T. Franke, Gross-Ottersleben, near Magdeburg, Germany.)

Cattleya Mossiae var. **alba sulphurea.** (*T. H.* 1907, ii. 4, t. 21.) G. A very fine variety, the flowers having white sepals and petals, and a sulphur-yellow lip, white at the margin. (F. Lambeau, Brussels.)

Cattleya spectabilis. See **C. bahiensis.**

Cattleya Trianae Mooreana. (*G. C.* 1907, xli. 226; *O. R.* 1907, 146; *G. M.* 1907, 240.) G. Sepals and petals light rosy lilac, the latter claret-coloured at the tip. Lip deep ruby-claret colour, orange at the base. (J. Bradshaw.)

Cereus anguinus. (*M. K.* 1907, 166.) Cactaceae. G. Branches decumbent, bent in places, up to 10 lin. in diam. Ribs 10–12, 1½–2 lin. broad. Areolae 2½–5 lin. apart, orbicular, clothed with a short dark brown wool. Radial spines 18–22, hoary-white, brown at apex and base, slender, 2½–3 lin. long; central 1 or 2, stronger, hoary-yellow, sometimes absent. Flowers somewhat irregular, tubular, orange-yellow, about 3 in. long. Paraguay. (Berlin B. G.)

Cereus xanthocarpus. (*M. K.* 1907, 65.) G. Stem 4–6-ribbed, 3½ in. across, rounded or depressed and spiny at the apex; ribs smooth, usually straight; areolae 1½–1¾ in. apart, round, shortly white-tomentose, or those at the apex at first glabrous, producing 3 or 4 very short conical dark brown spines. Flowers opening at night; tube 5 in. long, yellow-green in the lower part, white-green above; segments oblong to lanceolate, ¾–2½ in. long, ⅛–¾ in. broad, the outer white-green, the inner white. Paraguay. (W. Weingart, Nauendorf, near Ohrdruf, Germany.)

Chamaecyparis Lawsoniana Depkeni. (*M. D. G.* 1906, 87.) Coniferae. H. An elegant vigorous-growing variety, with a dull yellowish-white colouring up to late autumn, when it gradually passes to green. (G. W. Depken, Oberneuland-Rockwinkel, Bremen.) [*Cupressus.*]

Chamaecyparis pisifera columnaris. (*M. D. G.* 1906, 143.) H. Thickly and equally branched from below, the whole plant assuming a columnar form. (C. Ansorge, Klein Flottbek, Hamburg.) [*Cupressus.*]

Chrysanthemum maximum Davidsii. (*Gard.* 1907, lxxi. 296.) Compositae. H. Described as a fine variety, with strong stems of great length. (R. Holmes.)

***Cirrhopetalum appendiculatum** var. **Fascinator.** (*G. C.* 1907, xlii. 254, 260.) Orchidaceae. S. The sepals and petals have a deeper purple fringe and the sepals a darker claret-coloured tint than in the type. (Sir J. Colman.)

***Cirrhopetalum biflorum.** (*O. R.* 1907, 286.) S. Scape 2-flowered. Lateral sepals elongated, very acuminate, about 2½ in. long, light green, minutely dotted with red, and with 7 purple stripes at the base. Dorsal sepal lanceolate, about ¼ as long as the lateral, green, with 5 purple stripes. Petals broad, 3-toothed at the apex, greenish, with 3 purple stripes, pellucid-dotted. Lip much recurved, acute, mottled with brown. Java. (J. W. Moore.) [Syn. *Bulbophyllum biflorum*, Teijsm & Binn.]

Cleisostoma secundum. (*K. B.* 1907, 131.) Orchidaceae. S. Stem short. Leaves lanceolate-oblong, 3¾–5¼ in. long, about ½ in. broad. Scape decurved or subpendulous, 3–4 in. long. Flowers turned to one side, light rose-pink with the front lobe of the lip rose-purple. Sepals spreading, elliptic-oblong, 3 lin. long. Petals narrower than the sepals. Lip almost entire, elliptic-oblong, 3–3½ lin. long. Burma. (H. Low & Co.; Glasnevin B.G.)

Clematis quinquefoliata. (*G. C.* 1907, xli. 3.) Ranunculaceae. H. A new species allied to *C. Meyeniana*. It is a climbing shrub, with channelled stems at first pubescent, afterwards almost glabrous. Leaves pinnately, 5-foliolate; leaflets stalked, lanceolate or oblong-lanceolate, to 3¾ in. long and 1¼ in. broad. Flowers milky-white, borne, 5 or 6 together, on axillary peduncles shorter than the leaves. Sepals 4 or 5, oblong. Central China. (J. Veitch & Sons.)

***Clematis Sanderi.** (*G. C.* 1907, xli. 310.) G. Possibly a form of the very variable *C. aristata*. It is an evergreen plant, resembling *C. indivisa* in habit, but is less robust. Leaves narrowly lanceolate, 1–2 in. long, distinctly toothed. Flowers unisexual, in axillary clusters, sometimes a dozen or more together, fragrant. Sepals white, 1 in. long, narrow, recurved. Stamens ½ in. long, salmon-red, in a regular dense cluster. Australia. (F. Sander & Sons.)

***Clerodendron Fargesii.** (*B. S. D. F.* 1907, 207 ff.) Verbenaceae. H. A new species remarkable for the beautiful rather lax inflorescences of white flowers, which are about 1½ in. long including the stamens, and bright blue fruits encircled by a persistent intensely red calyx, borne on pedicels of the same colour. The leaves are cordate-ovate, purple when young, this colour persisting for a long time on the underside. Szechuen, China. (M. L. de Vilmorin, Les Barres, France.)

Cochlioglossa moortebeekiensis. (*J. H. F.* 1907, 428; *R. H. B.* 1907, 254.) Orchidaceae. G. A garden hybrid between *Odontoglossum Sceptrum* or *O. praenitens* and *Cochlioda Noetzliana*. (F. Lambeau, Brussels.)

Coelogyne Colmanii. (*G. C.* 1907, xli. 109, f. 48; *O. R.* 1907, 73, f. 8.) Orchidaceae. S. A garden hybrid between *C. speciosa major* and *C. cristata alba*. (J. Colman.) [Syn. *C. Colmanii magdeburgensis*; O. R. 1907, 90.]

***Columnea glabra major.** (*Lemoine Cat.* n. 165, 2; n. 167, 2.) Gesneraceae. S. Stems round. Leaves sessile, small, oval, fleshy, glabrous, dark green. Flowers axillary. Corolla scarlet, 3⅓ in. long; tube slightly curved, velvety outside; limb 2-lipped, the upper lip of a broad rounded entire lobe, and the lower of 3 pointed reflexed lobes. Stamens white. Costa Rica. (V. Lemoine & Son, Nancy.)

***Columnea magnifica.** (*Lemoine Cat.* n. 165, 2; n. 167, 3.) S. Stems round, very hairy when young. Leaves shortly petiolate, rather large, ovate-lanceolate or oblong, very hairy. Flowers usually solitary in the axils of the upper leaves; peduncle ½–¾ in. long. Corolla bright scarlet, 2½–3½ in. long; tube inflated about the middle; limb 2-lipped, 4-lobed; upper lobe broad, arching; lateral lobes short, spreading; lower lobe longer and narrower than the others, finally more or less spreading. See *G. C.* 1908, xliii. 66, f. 33. Costa Rica. (V. Lemoine & Son, Nancy.)

Comarella multifoliata. (*G. C.* 1907, xlii. 151.). Rosaceae. H. Leaves pinnate, 5–7 in. long, with small closely arranged leaflets, giving the plant a fern-like appearance. Flowers reddish-brown, inconspicuous. California. (Darmstadt B.G.) [Syn. *Potentilla depauperata*, Engelm.]

***Coreopsis bella.** (*K. B.* 1907, 364.) Compositae. H.H. An undershrub about 3 ft. high. Leaves petiolate, pinnatipartite, pubescent both sides; segments ovate-lanceolate, acute, more or less deeply toothed. Flower-heads pedunculate. Ray-florets 12, oblong-elliptic, 12-nerved, 1¼ in. long, subacute or obscurely toothed at the apex. A very handsome new species. British East Africa. (Kew.)

Corylus Colurna var. **chinensis.** (*J. H. F.* 1907, 516.) Cupuliferae. H. Differs from the type in having the cupule prolonged above the nut into a short tube, which is divided into divaricate lobes. Western China. (M. L. de Vilmorin, Les Barres, France.) [Syn. *C. chinensis*, Franch. in Journ. de Bot. 1899, 197.]

Cotoneaster applanata. (*G. C.* 1907, xlii. 253; *G. M.* 1907, 726.) Rosaceae. H. A pretty graceful species, with a drooping habit. Leaves small, ovate, entire. Fruits scarlet or dark red, in clusters on branches about 1 in. long. China? (J. Veitch & Sons.)

***Cotoneaster humifusa.** (*Gard.* 1907, lxxi. 237.) H. A densely branched shrub, having long trailing shoots covered with dark green leaves. Fruits scarlet. Central China. (J. Veitch & Sons.)

Crassula atrosanguinea. (*B. H. B.* 1907, 1013, ff.) Crassulaceae. G. Stem erect, 14–20 in. high, rigid, reddish, simple at the base, branched at the apex. Leaves like those of an *Aloe*, more or less recurved or straight, glabrous, gradually narrowed from the base to the apex, 2½–8 in. long, the lower crowded in a rosette and longer than those on the stem. Flowers many in a dense terminal cymose corymb. Petals dark red, ovate-lanceolate, 1½ lin. long. Stamens exserted. Transvaal. (W. Barbey, Pierrière, Geneva.)

Crinum amoenum var. **Mearsii.** (*G. C.* 1907, xlii. 62, f. 22.) Amaryllidaceae. S. Bulb round or ovoid, up to 2 in. across. Leaves ensiform, undulate, 8–12 in. long or more, 1 in. broad. Peduncle 3–4½ in. long. Umbel 6–10 flowered. Pedicels ¼ in. long. Perianth white, salver-shaped; tube slender, up to 5 in. long; segments spreading, lanceolate, 2½ in. long, ½ in. broad. It is smaller than the type. Upper Burma. (R. H. Beddome.) [Syn. *C. Mearsii*; G. C. 1907, xlii. 35; G. M. 1907, 531.)

***Crocus speciosus** var. **albus.** (*Gard.* 1907, lxxi. 613, f.) Iridaceae. H. Flowers white. (C. G. van Tubergen, Haarlem.)

***Crocus speciosus × pulchellus.** (*G. C.* 1907, xlii. 332.) H. Apparently a garden hybrid between the species named. (E. A. Bowles.)

Cryptomeria japonica argenteo-spicata. (*M. D. G.* 1906, 151.) Coniferae. H. A vigorous-growing form, with silvery white-tipped shoots. (H. Hellemann, Moorende, Bremen.)

Cyclamen punicum. (*R. H.* 1907, 328, t.) Primulaceae. H. Very closely allied to *C. persicum*. The leaves have a more open sinus and a cuneate expansion at the base. Peduncle longer. Sepals lanceolate, scarcely imbricate at the base. Corolla white or very slightly rose, red at the throat, very fragrant. Petals narrow, linear-lanceolate, acute. Tunis. (E. Gadeceau, Nantes, France.)

***Cydonia japonica Simonii.** (*G. M.* 1907, 332; *Gard.* 1907, lxxi., May 11, x.) Rosaceae. H. Flowers intense crimson-scarlet. (Lord Aldenham.)

Cymbidium Cravenianum. (*O. R.* 1907, 20.) Orchidaceae. G. A garden hybrid between *C. Lowianum* and *C. Tracyanum*. (J. W. Moore.)

***Cymbidium insigne.** (*R. H.* 1907, 495, f. 166, and col. t.) S. Closely allied to *C. Lowianum*, but much finer. The flowers are large, with the sepals and petals white, suffused and veined with rose, darker outside, the lip densely spotted with crimson, yellow on the disk, and the column deep crimson. Annam. (C. Béranek, Paris.)

***Cymbidium pumilum.** (*K. B.* 1907, 130.) G. Pseudobulbs ovoid, small, 3–5-leaved. Leaves elongate-linear, 6–12 in. long, 3–6 lin. broad. Scape suberect, 4–6 in. long, many-flowered. Sepals oblong, somewhat spreading, about ¾ in. long, light reddish brown. Petals narrowly elliptic-oblong, 7½ lin. long, similar in colour to the sepals. Lip suberect, 3-lobed, 6–7 lin. long, white, with a few red-brown spots on the front lobe, numerous minute lines and dots on the side lobes, and the disk and keels bright yellow. Yunnan, China. (Kew.)

Cymbidium Woodhamsianum. (*O. R.* 1907, 116.) G. A garden hybrid between *C. Lowianum* and *C. eburneo-Lowianum*. (Armstrong & Brown.)

Cypripedium Armstrongiae. (*G. C.* 1907, xlii. 419.) Orchidaceae. S. A garden hybrid between a form of *C. nitens* and *C. Charlesworthii*. (Armstrong & Brown.) [*Paphiopedilum.*]

Cypripedium barbatum bruxellense. (*R. H. B.* 1907, 67.) S. A finely-coloured form. (E. Draps-Dom, Laeken, Belgium.) [*Paphiopedilum.*]

Cypripedium Charlesworthii rubrum. (*G. C.* 1907, xlii. 254.) S. A form with very large and finely coloured flowers. (H. Low & Co.) [*Paphiopedilum.*]

Cypripedium Dicksonianum. (*G. C.* 1907, xli. 161; *G. M.* 1907, p. 178.) S. A garden hybrid between *C. villosum aureum* and *C. Euryades*. (F. Wellesley.) [*Paphiopedilum.*]

Cypripedium Dietrichianum. (*R. H. B.* 1907, 394.) S. A garden hybrid between *C. Stonei* and *C. bellatulum*. (F. Lambeau, Brussels.) [*Paphiopedilum.*]

Cypripedium keighleyense. (*O. R.* 1907, 346.) S. A garden hybrid between a form of *C. nitens* and *C. Arthurianum*. (J. H. Craven.) [*Paphiopedilum.*]

Cypripedium majesticum. (*R. H. B.* 1907, 394.) G. A garden hybrid between *C. Leeanum* and the Harefield Hall variety of *C. insigne*. (J. Hye de Crom, Conpure, Ghent.) [*Paphiopedilum.*]

Cypripedium waltonense. (*G. C.* 1907, xlii. 286; *O. R.* 1907, 351.) S. A garden hybrid probably between *C. Curtisii* and *C. niveum*. (W. Thompson.) [*Paphiopedilum.*]

Cyrtanthus Junodii. (*B. H. B.* 1907, 437, ff.) Amaryllidaceae. G. Bulb ovoid, 4 in. long, 1¾ in. in diam., dark brown. Leaves 4 or 5, ligulate-lanceolate, 1–1¾ feet long, 7½–10 lin. broad, obtuse, arching. Scape erect, round, 10–20 in. long. Umbel 6–9-flowered. Flowers cinnabar, yellow at the apex, pendulous, 1½–1¾ in. long. Transvaal. (W. Barbey, Pierrière, Geneva.)

Cyrtomium falcatum Rochfordii. (*G. C.* 1907, xli. 160; *G.M.* 1907, 163, 165, f.) Filices. G. Differs from the type in having the margins of the pinnae much divided. (T. Rochford & Sons.) [*Aspidium falcatum var.*]

***Cytisus Beani.** (*G. C.* 1907, xli. 313.) Leguminosae. H. A garden hybrid between *C. Ardoini* ♀ and apparently *C. purgans*. It has a prostrate habit and golden-yellow flowers. (Kew.)

***Davallia brasiliensis.** (*G. C.* 1907, xli. 392; *G. M.* 1907, 450, f.) Filices. G. A distinct and elegant species. Fronds 4 ft. long, smooth, deep shining green, with long attenuated pinnules. Brazil. (H. B. May & Sons.)

Delphinium candidum. (*B. M.* t. 8170.) Ranunculaceae. H. H. A dwarf slightly hairy perennial, with usually 3-flowered branches. Leaves palmately 5-lobed, the largest 4–5 in. across, the lowest on stalks 8–15 in. long. Flowers pure white, scented like the primrose, about 2½ in. across, with a slender spur 1½–2 in. long. Uganda. (Lady Hindlip.)

Delphinium macrocentron. (*B. M.* t. 8151.) H. H. or H. A perennial herb, hairy in nearly all parts. Stems 5 ft. high or more, slightly branched. Leaves stalked, palmately divided; primary segments 3–7, ⅛–1 in. across, 3-many-lobed; lobes acute. Flowers hairy, blue and green or yellow and green, with a whitish apex, about 2 in. long, several together in a raceme; spur broad, straight, erect. Mountains of East Tropical Africa. (J. O'Brien.)

Dendrobium Boundii. (*O. R.* 1907, 104.) Orchidaceae. S. A garden hybrid beween *D. Hildebrandii* and *D. Findlayanum*. (J. Colman.)

Dendrobium chryseum giganteum. (*G. C.* 1907, xli. 290.) A large fine form. (F. Sander & Sons.)

Dendrobium fusiforme. (*G. C.* 1907, xli. 337, f. 142; *O. R.* 1907, 136.) S. Resembles a dwarf slender form of *D. speciosum*, but it differs from that species in having fusiform pseudobulbs seldom more than 1 ft. long, and very slender racemes, 6–10 in. long, of white or yellow flowers, with purple lines on the lip. It was in cultivation in 1885, but was then considered to be a slender form of *D. speciosum*. Queensland. (Sir C. Strickland.)

Deutzia discolor carnea. (*R. H. B.* 1907, 373; *Jard.* 1907, 325; *Gard.* 1907, lxxi. 541.) Saxifragaceae. H. A garden hybrid between *D. scabra* and *D. discolor grandiflora*. (V. Lemoine & Son, Nancy.)

Deutzia discolor lactea. (*R. H. B.* 1907, 373; *Jard.* 1907, 325; *Gard.* 1907, lxxi. 541.) H. A garden hybrid between *D. scabra* and *D. discolor grandiflora*. (V. Lemoine & Son, Nancy.)

***Deutzia gracilis candelabrum.** (*R. H. B.* 1907, 373, f.; *Jard.* 1907, 325, f. 181; *Gard.* 1907, lxxi. 541.) H. A garden hybrid between *D. gracilis* and *D. Sieboldiana*. (V. Lemoine & Son, Nancy.)

Dipelta floribunda. (*G. C.* 1907, xlii. 3, f. 1.) Caprifoliaceae. H. A handsome deciduous shrub allied to *Diervilla*. Leaves opposite, ovate-lanceolate, 3–3½ in. long, 1–1½ in. broad, acuminate, slightly toothed; petioles short. Flowers solitary, axillary, or in few-flowered racemes terminating the short branches formed all along the previous year's growth. Corolla tubular, 1¼ in. long, rose-pink passing to white outside, white with yellow veining inside. Central China. (J. Veitch & Sons.)

Disa equestris. (*G. C.* 1907, xli. 114.) Orchidaceae. G. Basal leaves lanceolate, about 6 in. long. Flowering-stem 1 ft. high, with a few widely separated lanceolate leaves on the lower half, and smaller ones above. Flowers with a pale blue or light voilet funnel-shaped dorsal sepal about 1 in. long, pale violet deflexed lower sepals, and small white petals bearing an elongated reddish spot at the tips. Rhodesia. (Lord Rothschild.)

Diuris longifolia. (*O. R.* 1907, 123.) Orchidaceae. G. A terrestrial plant, 1 ft. high or more. Leaves radical, few, narrow. Flowers yellow and purple, moderately large, several together on a scape. Dorsal sepal broadly ovate; lateral sepals long and narrow. Petals spreading, spathulate. Lip deeply 3-lobed. Western Australia. (J. Wilson Potter.)

***Echeveria cuspidata.** (*M. K.* 1907, 184, f.). Crassulaceae. G. Stemless. Leaves in a dense rosette, bluish-white and very hoary both sides, obovate, about 2½ in. long. Peduncle 8–10 in. long. Flowers in a forked cyme, on pedicels about 5 lin. long. Corolla 5 lin. long, purple inside, with yellowish slightly spreading acute lobes. Mexico. (Darmstadt B. G.) [*Cotyledon.*]

***Echeveria turgida.** (*M. K.* 1907, 148, f.) G. Stemless. Leaves very numerous, in a compact rosette, spathulate-oblong, much swollen, grey-green, spinescent at the apex. Peduncle about 4 in. long, red above, pallid below. Flowers 4–11, in a 1-sided raceme. Corolla 5-angled, rose-coloured, or yellow-red inside and paler outside; lobes acuminate. Mexico. (Washington B. G.; Darmstadt B. G.) [*Cotyledon.*]

Echinocactus brachyanthus. (*M. K.* 1907, 123.) Cactaceae. G. Stem simple, depressed-globose, tubercled and unarmed at the apex. Ribs 22, divided by transverse furrows into 5- or 6-sided tubercles about 1¼ in. long. Areolae narrowly elliptic, shortly woolly. Radial spines 5 or 7, very strong, 5–12 lin. long, yellowish; central usually none. Flowers funnel-shaped, rose-coloured, 2½ in. long. Argentina. (Berlin B. G.)

Echinocactus Fobeanus. (*M. K.* 1907, 187.) G. Stem globose, dark green, depressed at the summit, where it is clothed with a white wool. Ribs 14, twisted. Radial spines 8 or 9, about ½ in. long, black when young; central 1 or 2 or sometimes wanting. Flowers pale yellow. Probably Chili. (Berlin B. G.)

Echinocactus Fricii. (*M. K.* 1907, 174.) G. A new species intermediate between *E. tetracanthus* and *E. Martini*, but it grows to a larger size and differs in its flowers. Argentina. (F. Reichenbach, Dresden.)

***Echinocactus Grossei.** (*B. K.* t. 89; *M. K.* 1907, 56.) G. Stem elongated, about 4 in. high, somewhat depressed above, clothed with white wool. Ribs 17, separated by sharp furrows. Areolae very small. Spines 4 or 5, spreading, up to 1¼ in. long, the lowest the longest. Flowers 2½ in. long, nearly 4 in. across, pale citron-yellow. Paraguay. (Berlin B. G.)

Echinocactus Maassii. (*Gfl.* 1907, 410, f. 50.) G. Stem simple, semi-globose to obovoid, 3–4 in. high or more, 3–4 in. in diam., slightly depressed at the summit where it is covered by bright brown spreading spines. Ribs 13–21, separated by somewhat winding longitudinal furrows, in older plants spirally twisted. Areolae at the summit oval to circular, at first covered with a short white wool, afterwards glabrescent. Radial spines 10–15, 2½–7½ lin. long, at first yellow, afterwards whitish; central 4, in the form of an oblique cross, thickened at the base, the lowermost the longest, often 1¼ in. long. Flowers produced from the areolae at the summit. Bolivia. (Berlin B. G.)

Echinocactus platensis. (*M. K.* 1907, 8, f.) G. Stem cylindric-globose. Ribs 9–14. Areolae elliptic, densely clothed with brown wool, eventually glabrous. Radial spines usually 7, 2½–7½ lin. long; central wanting. Flowers produced near the summit of the stem, 2½–3 in. long; segments snow-white, the outer grey-green on the back, the innermost white-red at the base. Argentina. (Darmstadt B. G.)

***Echinocereus Kunzei.** (*M. K.* 1907, 103.) Cactaceae. G. A tufted plant with glaucous erect cylindric stems up to 10 in. high and 3½ in. in diam. Ribs 13, straight. Radial spines 15–17, subulate, straight, white, 4–5 lin. long; central 1–3, stronger, 5–6 lin. long. Flowers 3¾ in. long, scarlet-crimson; segments narrowly lanceolate to spathulate, ¾–2¼ in. long. Arizona. (Berlin B. G.)

Echinopsis lateritia. (*M. K.* 1907, 128, 151.) Cactaceae. G. Stem simple, ellipsoid, glaucous-green, about 3 in. high, slightly depressed and unarmed at the summit. Ribs 16, subsinuate, somewhat obtuse. Radial spines 8–10, curved, up to 5 lin. long; central 1 or 2, longer; all thickened at the base, shining brown, afterwards canescent. Flowers funnel-shaped, about 2 in. long, scarlet-brickred; tube very short, pilose outside. Bolivia. (Berlin B. G.)

Echinopsis mamillosa. (*M. K.* 1907, 128, 135.) G. Stem simple, depressed-globose, 2½ in. high, 3¼ in. in diam. shining dark green, tubercled and unarmed at the apex. Ribs 17, divided by deep furrows into acute tubercles. Areolae 4–6 lin. apart, irregularly orbicular. Radial spines 8–10, subulate, 2½–5 lin. long; central 1–4, somewhat stronger and longer than the radial, all yellowish, brown at the apex. Flowers about ¾ in. long, white, rose-coloured towards the apex of the segments. Bolivia. (Berlin B. G.)

Echinopsis Meyeri. (*Gfl.* 1907, 1, t. 1538.) G. A very distinct new species. Stem globose, somewhat depressed at the summit, pale green, about 4 in. in diam. Ribs 14–16, acute, occasionally somewhat spiral. Spines subulate, 7 or 8 radial and 1 central. Flowers numerous, lateral, club-shaped, 6–8 in. long, 5–10 lin. across. Calyx-tube furnished with brownish green scales from which protrude abundant gray wool. Sepals and petals reduced to peculiar twisted terete threads, the outer brownish, the inner dirty white. Paraguay. (E. Heese, Gr. Lichterfelde, Berlin.)

Enkianthus chinensis. (*G. C.* 1907, xli. 363.) Ericaceae. H. A much branched bush or small tree. Leaves shortly stalked, very variable in shape and size, usually elliptic or obovate-elliptic, narrowed at apex and base, serrulate, glabrous. Flowers in pendulous racemes 2½–3 in. long. Corolla broadly campanulate, yellowish-orange, striped with red. Central and Western China. (J. Veitch & Sons.)

Enkianthus quinqueflorus var. **serrulatus.** (*G. C.* 1907, xli. 344.) H. Differs from the type in its much less coriaceous finely serrulate leaves, more or less villous on the midrib beneath, and in having pure white flowers. Central and Western China. (J. Veitch and Sons.)

Epicattleya balarucensis. (*O. R.* 1907, 90.) Orchidaceae. G. A garden hybrid between *Cattleya labiata* and *Epidendrum eburneum.* (F. Denis, Balaruc les Bains, Herault, France.)

Epidendrum campylostalix. (*G. C.* 1907, xlii. 221.) Orchidaceae. A curious species with glaucous green pseudobulbs and leaves. Flower-spikes decurved. Flowers yellowish, tinged with chocolate colour, whitish on the lip. Central America. (Sir Trevor Lawrence.) [*E. campylostalyx*, Reichb., f.)

Eranthemum Dutremblayanum. (*J. H. F.* 1906, 553.) Acanthaceae. S. A garden hybrid between *E. verbenaceum* and *E. longifolium.* (Dutremblay du May, Courbevoie, Seine, France.)

Eranthemum Magneanum. (*J. H. F.* 1906, 553.) S. A garden hybrid between *E. verbenaceum* and *E. longifolium.* (Dutremblay du May, Courbevoie, Seine, France.)

***Eremostachys superba.** (*G. C.* 1907, xli. 365.) Labiatae. H. Leaves pinnatisect, forming a rosette at the base of the single stem. Stem about 1 ft. high. Flowers deep primrose-yellow, in woolly heads 4–6 in. long and 3–4 in. broad. Western Himalaya. (Kew.)

Eremurus Bungei citrinus. (*R. H.* 1907, 366; *J. H. F.* 1907, 402.) Liliaceae. H. More robust than the type, with larger citron-yellow flowers. It is possibly a hybrid between *E. Bungei* and *E. Olgae.* (Vilmorin-Andrieux & Cie., Paris.)

Eremurus vedrariensis. (*R. H.* 1907, 229, f. 83.) H. A garden hybrid between *E. robustus* and *E. spectabilis?* (Ph. L. de Vilmorin, Verrières, France.)

***Eria longispica.** (*B. M.* t. 8171.) Orchidaceae. S. A new species very nearly allied to *E. latifolia.* It is a vigorous-growing plant with erect habit, broad leaves 12–16 in. long, and long spikes of very numerous small flowers, which are yellow, blotched with reddish-purple. The lip is obicular in outline, not obovate as in *E. latifolia.* Borneo. (Kew.)

***Eria rhyncostyloides.** (*G. C.* 1907, xlii. 370.) S. A handsome new species most nearly allied to *E. convallarioides*, which it resembles in the structure of the flowers, but it is a much larger

plant and more fleshy. Leaves 3 or 4, 12–18 in. long, 2 in. broad, thick, bright green. Inflorescence 8 in. long, consisting of 250–300 flowers about ½ in. across, in a cylindric stalked spike. Flowers white, slightly rose-tinted, the surface with a granulated or frosted appearance. Java. (Hon. W. Rothschild.)

*Erica Veitchii. (*G. C.* 1905, xxxvii. 138, 223, ff. 97, 100; *Gard.* 1907, lxxi. 101, f.) Ericaceae. H. or H.H. A garden hybrid between *E. arborea* and *E. lusitanica*. (R. Veitch & Sons.)

Ervum gracile. See Lathyrus filiformis.

Eryngium proteaeflorum. (*G. C.* 1907, xli. 248, ff. 103, 107.) Umbelliferae. H.H. or H. A spreading bushy herb. Leaves silvery green, linear, 19–24 in. long, ½–1 in. broad, with longitudinal fine white furrows, furnished with spines on both edges about ¾ in. long. Flowering-stems 3 ft. high, much branched. Flower-heads light blue, 2–3 in. long, 1½ in. across, 1 or 2 together, surrounded by a whorl of large silvery white bracts. Mexico. (C. Sprenger, Naples.)

Eupatorium deltoideum. (*B. T. O.* 1907, 13.) Compositae. G. A shrubby evergreen species. Leaves long-stalked, triangular, hastate or sagittate at the base, toothed, green above, pale green beneath, somewhat rugose. Flower-heads large, rosy purple, in terminal panicles. Mexico. (C. Sprenger, Naples.)

Euphorbia cirsioides. (*R. H.* 1907, 492, f. 161.) Euphorbiaceae. S. A shrubby species somewhat resembling a thistle in appearance. Stem much branched, fleshy, smooth, not channelled, bearing numerous wing-like appendages; branches short, terminating in a very sharp spine. Leaves absent. Flowers and fruit unknown. See *B. M. H. N.* 1905, 348. Madagascar. (Paris B. G.)

Euphorbia Intisy. (*R. H.* 1907, 492, f. 160.) S. A small tree 20–23 ft. high. Branches dichotomous or almost whorled, jointed, fleshy. Leaves few, minute. Flowers small, in very short cymes. The plant, known by the native name "Intisy" is interesting as a source of rubber. See *B. M. H. N.* 1900, 257–262, ff. 1–4. Madagascar. (Paris B. G.)

*Fagus sylvatica var. fastigiata. (*G. C.* 1907, xli. 149.) Cupuliferae. H. The Dawyck Beech, remarkable for having erect branches. (F. R. S. Balfour.)

Felicia petiolata. (*G. C.* 1907, xlii. 81, f. 34.) Compositae. H.H. Distinguished from *Agathaea amelloides* by having procumbent or pendulous stems and alternate toothed leaves. Leaves shortly stalked, ovate, ¾–1 in. long. Flower-heads solitary, ¾–1 in. across, on slender peduncles about 2 in. long; ray-florets rosy-purple or mauve; disk-florets yellow. South Africa. (F. Denis, Balarac les Bains, Herault, France.) [Syn. *Aster petiolatus*, Harv.)

*Ferula communis var. brevifolia. (*B. M.* t. 8157; *K. B.* 1907, 375.) Umbelliferae. H.H. Differs from the type in having the ultimate segments of the leaves shorter. This plant is the source of the gum ammoniac of Marocco. Mediterranean Region. (Kew.)

Fraxinus holotricha. (*M. D. G.* 1906, 67; *Späth Cat.* 1907–08, 100.) Oleaceae. H. A new species of the subgenus *Fraxinaster*, remarkable for the copious pubescence on the branches and leaves, and the shortly hispid ovary. A moderately large tree. Buds dark brown. Leaflets 7–13, distinctly stalked, lanceolate or ovate-lanceolate, 1½–3 in. long. Racemes short, with 10 hermaphrodite flowers. Native country unknown. (L. Späth, Berlin; Berlin and Dresden B. G. Cultivated under the name of *F. potamophila*.)

*Fraxinus Spaethiana. (*Späth Cat.* 1907–08, 101.) H. A beautiful tree with large bright green pinnate leaves. It has been distributed as *F. Sieboldiana*. (L. Späth, Berlin.)

*Glaucium leiocarpum. (*Jard.* 1907, 29; *B. T. O.* 1907, 215.) Papaveraceae. H. A tufted plant about 1½ ft. high. Leaves glaucous. Flowers 2½–3 in. across, deep orange-scarlet, with large black blotches at the base of the petals. Asia Minor. (Haage & Schmidt, Erfurt.)

*Haberlea rhodopensis var. virginalis. (*G. C.* 1907, xli. 322; *G. M.* 1907, 378.) Gesneraceae. H. Flowers pure white. (R. Farrer.)

Haemanthus virescens × albiflos. (*Gfl.* 1907, 493, f. 61.) Amaryllidaceae. G. A garden hybrid. (Freiburg B. G.)

***Haworthia Pearsoni.** (*K. B.* 1907, 365.) Liliaceae. G. A stemless plant. Leaves about 80, crowded, spirally arranged, oblanceolate-oblong, 1¼ in. long, about ½ in. broad, pale green, white-striate and furnished with 2 rows of cilia on the back, each with a bristle at the apex about ¼ in. long. Scape 10 in. long. Perianth 7½ lin. long, curved in the lower part: segments oblong, obtuse, pale flesh-coloured, brown-ribbed. South Africa. (Kew.)

Helianthus ciliaris. (*G. C.* 1907, xlii. 342; *R. H.* 1907, 467.) Compositae. H. A pretty floriferous species 16-24 in. high. Stems erect, glabrous, slender, hard. Leaves narrow, undulate, glaucous-green. Flower-heads large, with bright golden-yellow ray-florets and dark brown disk-florets. Mexico. (H. Correvon, Floraire, near Geneva.)

***Herbertia Amatorum.** (*K. B.* 1907, 321.) Iridaceae. G. Corm globose, with brown scales. Leaves lanceolate, plicate, acuminate, 8 in. long, 4 lin. broad. Scape 18 in. high, cylindric, very slender, branched. Spathes herbaceous, the outer 1 in. long, the inner almost twice as long. Perianth 2 in. across; outer segments violet, with the midrib white inside, 3 times as long as the inner; claw with a heart-shaped white blotch edged with blue; inner segments violet, brown-spotted at the base. Uruguay. (Kew.)

Hydrangea arborescens var. **grandiflora.** (*G. C.* 1907, xli. 322; *Gard.* 1907, lxxi. 176; *G. M.* 1907, 357, f.; *Jard.* 1907, 340, f. 196.) Saxifragaceae. H. Taller-growing than the type, and all the large pure white flowers are sterile. (Paul & Son; V. Lemoine & Son, Nancy.)

Hoya Engleriana. (*N. B.* iv. 315, t. 2). Asclepiadaceae. S. A new species most nearly allied to *H. linearis*, but it differs in habit and has distinctly smaller leaves. It is an epiphyte, with elongated filiform partly dependent branches. Leaves shortly stalked, lanceolate or narrowly ovate-lanceolate, 7½ lin. long, 2 lin. broad, involute. Flowers fragrant, 4 together in terminal umbels. Corolla whitish, 7½ lin. across, fleshy, deeply 5 lobed. Siam. (Berlin B. G.)

***Impatiens oppositifolia.** (*G. C.* 1907, xlii. 102, f. 40.) Geraniaceae. G. A very floriferous species with a free branching habit. Leaves small, opposite, lanceolate. Flowers about 1 in. across, pink to rosy-red or rosy-purple. India and Ceylon. (Kew.)

***Indigofera hebepetala.** (*I. S. H. T.* vi. 69, t. 219.) Leguminosae. H. A branched shrub; branches slightly pubescent when young, afterwards glabrescent. Leaves 4-7 in. long, of 9-17 oblong leaflets which are about 2 in. long and ¾ in. broad. Flowers small, reddish, loosely arranged in short axillary racemes. Himalaya. (L. van den Bossche, Tirlemont, Belgium.)

Iris laevigata var. **alba.** (*B. T. O.* 1907, 356) Iridaceae. H. Flowers white with a golden blotch on the larger segments. (C. Sprenger, Naples.)

***Iris melanosticta.** (*Gfl.* 1907, 495.) H. A new species of the Apogon group, most nearly allied to *I. Grant-Duffii*, being similar in habit and foliage, but differing in the colour of the flowers. The outer segments are yellow, paler towards the base, where they are dark violet-veined, and bear on the limb 4 or rarely 5 large dark violet blotches. Inner segments pale yellow, somewhat shorter. Syria. (G. Egger, Jaffa.)

Juglans Duclouxiana. (*B. S. D. F.* 1906, 73, 75, 81, ff.) Juglandaceae. H. A new species closely allied to *J. regia*, from which it is easily distinguished by its longer more elliptic more acuminate often cuspidate leaflets, and the nut acute and mucronate at the summit, having a very fragile shell with slightly bony partitions. Yunnan, China. (L. A. Dode, Paris.)

Juglans kamaonia. (*B. S. D. F.* 1906, 73, 75, 86, ff.) H. Leaves with 3–5 pairs of usually lanceolate very pubescent leaflets. Nuts globose with a hard shell sinuous inside, having moderately well developed partly bony partitions. Himalaya. (L. A. Dode, Paris.) [Syn, *J. regia* var. *kamaonia*, C. DC.]

***Kaempferia lutea.** (*K. B.* 1907, 60.) Scitamineae. S. A stemless plant. Leaves 3 or 4, oblong, about 9 in. long and 4 in. broad, green and glabrous above, paler and pilose beneath; petiole 2½ in. long. Scape central, 3½ in. high. Bracts about 8, rounded,

about ¾ in. broad, green. Corolla yellow; tube cylindric, ¾ in. long; lobes oblong, 7½ lin. long; lip orange-yellow, entire, broadly ovate, 1 in. long, ½ in. broad. Penang. (Kew.)

*Kennedya retrorsa. (*B. M.* t. 8144.) Leguminosae. G. A new species characterised by the densely retrorse-pilose pod. A twining shrub, the young growths clothed with reddish hairs. Leaves trifoliolate, stalked, 3–6 in. long; leaflets oval to nearly round, 1–2½ in. long. Raceme including peduncle 2–10 in. long. Flowers rose-purple, with a white spot on the standard, about ⅝ in. across. Eastern Australia. (Kew.)

Laburnum alpinum aureum. (*M. D. G.* 1906, 212.) Leguminosae. H. The leaves are completely and constantly a beautiful golden-yellow. (R. Behnsch, Dürrgoy, Breslau.)

Laelia majalis × tenebrosa. (*J. H. F.* 1906, 616.) Orchidaceae. G. A garden hybrid. (Ét. Bert, Bois-Colombes, Seine, France.)

Laelia Sidneyana. (*G. C.* 1907, xlii. 230.) S. A garden hybrid between *L. cinnabarina* and *L. Jongheana*. (H. A. Tracy.)

Laelia Statherae. (*G. C.* 1907, xli. 226.) S. A garden hybrid between *L. purpurata* and *L. flava*. (D. J. Stather Hunt.)

Laelio-cattleya Duquesnei. (*O. R.* 1907, 92.) Orchidaceae. G. A garden hybrid between *L.-c. warnhamensis* and *Laelia purpurata*. (E. Cappe, Vesinet, France.)

Laelio-cattleya Lawrenceano-callistoglossa. (*R. H.* 1907, 195.) G. A garden hybrid. (A. A. Peeters, Brussels.)

Laelio-cattleya Maurici. (*J. H. F.* 1907, 285.) G. A garden hybrid between *Laelia purpurata* and *Cattleya Trianae*. (L. Duval & Son, Versailles.)

Laelia-cattleya odora. (*J. H. F.* 1906, 777.) S. A garden hybrid between *Cattleya Mendeli* and *Laelia purpurata*. (A. Régnier, Fontenay-sous-Bois, Seine, France.)

Laelia-cattleya stellata. (*O. R.* 1907, 149.) G. A garden hybrid between *Laelia xanthina* and *Cattleya intermedia alba*. (F. Wellesley.)

Laelio-cattleya Veisenpachii. (*O. R.* 1907, 92.) G. A garden hybrid between *L.-c. warnhamensis* and *Cattleya Trianae*. (E. Cappe, Vesinet, France.)

Laelio cattleya Wavrinii. (*O. R.* 1907, 249, f. 29.) G. Supposed to be a natural hybrid between *Cattleya Walkeriana* and *Laelia Boothiana*. (Marquis de Wavrin, Château de Ronsele, Ghent.)

Laelio-cattleya Wolteriae. (*O. R.* 1907, 39, 145, f. 15.) G. A garden hybrid between *Laelia anceps* and *Cattleya Loddigesii*. (P. Wolter, Magdeburg, Germany.)

Lagenaria verrucosa var. Giordaniana. (*B. P.* vi. 142, f.) Cucurbitaceae. G. The species differs from *L. vulgaris* in having globose fruits covered with tubercles. The variety has pear-shaped fruits. Rhodesia. (Palermo B. G.)

Lathyrus filiformis. (*G. C.* 1907, xlii. 48.) Leguminosae. H. A dwarf free-flowering species about 1 ft. high, with a bushy habit. Leaves pinnate, having 2–3 pairs of narrow leaflets. Flowers large, violet-purple, 8 or more, in racemes. South Europe. (Kew; M. Prichard.) [Syn. *Ervum gracile*; G. C. 1907, xli. 426; J. of H. 1907, lv. 91, f.; not of DC. or Stev.]

Lewisia columbiana. (*G. C.* 1907, xli. 295.) Portulaceae. H. Leaves narrow, fleshy, slightly pubescent, forming a small tuft. Flowers small, red, in panicles. North-western United States. (A. K. Bulley.) [Syn. *Calandrinia columbiana*, Wats.]

*Lewisia Cotyledon. (*G. C.* 1907, xli. 295.) H. Leaves 2 in. long, 1 in. broad, in a rosette, fleshy. Stem fleshy, 4 in. high or more, freely branched. Flowers numerous, rosy, each with 10 petals. Bracts and sepals covered on the margin with reddish gland-tipped hairs. Northern California. (Kew.) [Syn. *Calandrinia Cotyledon*, Wats.]

*Lewisia Leana. (*G. C.* 1907, xli. 295; *G. M.* 1907, 493.) H. Leaves in a tuft, fleshy, terete, 2 in. long, glaucous, evergreen. Flower-stems graceful, much branched, 6–9 in. high. Flowers numerous, small, white streaked with red. Petals 7. Northern California, (A. K. Bulley.) [Syn. *Calandrinia Leana*, Porter.]

***Lewisia pygmaea.** (*G. C.* 1907, xli. 295.) H. A very small species, only 1–2 in. high, with tufts of linear fleshy leaves and numerous small flowers. Rocky Mountains. (A. K. Bulley.) [Syn. *Calandrinia pygmaea*, Gray.]

***Lobelia Richardsonii.** (*G. W.* 1907, 544; *G. C.* 1907, xlii, 76.) Campanulaceae. G. Stems spreading or drooping, 12–16 in. long. Leaves cordate, crisped, small as in the bedding *Lobelia*. Flowers light blue, in a long terminal raceme. (J. Veitch & Sons.) [A garden variety of *Lobelia Erinus*, Linn.]

Lonicera Giraldii. (*R. H.* 1907, 300, f. 98.) Caprifoliaceae. H. A vigorous twining shrub. Leaves shortly stalked, lanceolate, 2–2½ in. long, 7½–9 lin. broad at the base, gradually acuminate, cordate at the base, velvety on both sides. Flowers dull red, scarcely fragrant, about 15 together in heads terminating short branches. Corolla small; tube cylindric, 7½ lin. long; limb 2-lipped; lips reflexed or rolled back, the upper 4 times larger than the lower. Western China. (Ph. L. de Vilmorin, Verrières, France.)

Lonicera retusa. (*Sargent, T. & S.* ii, 49, t. 123.) H. An erect much branched graceful shrub about 6 ft. high. Leaves deciduous, shortly stalked, obovate or broadly ovate, ½–1 in. long, ¼–¾ in. broad, obtuse truncate or emarginate at the apex, dark green above, bluish white beneath. Flowers in pairs, white, becoming yellowish, on short peduncles. Corolla 2-lipped, about ½ in. long. Fruit subglobose, ¼–⅓ in. in diam., shining black. Western China. (J. Veitch & Sons.)

***Lonicera utahensis.** (*Späth Cat.* 1907–08, 107.) H. A finely-branched erect shrub 3–5 ft. high. Leaves oblong, subcordate at the base, 2 in. long, 1 in. broad. Flowers greenish yellow, scarcely ½ in. long. Berries pale scarlet. Utah. (L. Späth, Berlin.)

***Lopezia miniata.** (*R. H. B.* 1907, 157, f. 36.) Onagraceae. G. A slender shrub with a terete glabrous stem and small ovate-oblong serrate leaves. Flowers numerous, small. Sepals spreading. Petals red in the lower part, rose with violet margins in the upper part. Mexico and Guatemala. (V. Heursel-De Meesten.)

Magnolia grandiflora Kathariniana. (*G. C.* 1907, xlii. 390.) Magnoliaceae. H. A form with ascending branches, smaller usually twisted yellowish leaves, smaller petals destitute of a claw and having yellow or light yellow veins. (Acclimatation Garden, Nikita, Walta, Crimea.)

Malus Dawsoniana. (*Sargent, T. & S.* ii. 23, t. 111.) Rosaceae. H. A natural hybrid between *M. fusca* and *M. communis*. Oregon, U.S.A. (Arnold Arboretum.) [*Pyrus.*]

Malus Hartwigi. (*M. D. G.* 1906, 60.) H. A hybrid between *M. baccata* and *M. Halliana*. (K. G. Hartwig, Lübeck.) [*Pyrus.*]

Mammillaria hidalgensis. (*M. K.* 1907, 118, f.) Cactaceae. G. Stem simple, cylindric, up to 1 ft. high or more, rounded at the apex. Tubercles in about 21 rows, remote, conical, obliquely truncate. Areolae floccose-woolly when young, glabrous when old. Radial spines none; central 4, cruciately arranged, sometimes 2, about 5 lin. long, gray or pale brown. Flowers carmine, about ¾ in. long; segments short, narrowly lanceolate, acuminate. Mexico. It has been proposed to distinguish the form with 2 spines as a variety under the name *bispina*. (Darmstadt B. G.)

Mammillaria Knippeliana. (*M. K.* 1907, 59.) G. Stem about 3 in. high and 2½ in across, simple or later becoming branched, sometimes forked, rounded above, slightly depressed at the summit which is sparingly woolly and crowned with white spines blood-red at the tips. Tubercles when young pyramidal, 4-sided, 4 lin. long, about 2½ lin. broad at the base. Areolae circular, at first white-woolly, soon glabrescent. Spines usually 6, up to 1¼ in. long, whitish with blood-red or brown tips, sometimes accompanied with smaller spines. Flowers and native country unknown. (C Knippel, Klein Quenstedt, Germany.)

Mammillaria littoralis. (*M. K.* 1907, 80.) G. A species closely resembling *M. mazatlanensis* and probably not distinct. It is, however, stronger in growth, and its spines are a little longer and of a darker brown colour. California? (Berlin B. G.)

Mammillaria petrophila. (*M. K.* 1907, 55, f.) G. Stem depressed-globose or often cylindric-globose, up to 6 in. high and broad, at first

simple, then branched, with a milky juice. Tubercles about 5 lin. long, broad at the base, obliquely truncate. Areolae oval, of the younger tubercles with a brownish wool, of the older glabrous. Spines chestnut-brown or whitish at the base; radial 8-10, about 10 lin. long; central 1 or rarely 2, twice as long, stouter. Flowers bright greenish gold, 9–10 lin. long. Lower California. (Darmstadt B. G.)

Mammillaria strobiliformis var. **durispina.** (*M. K.* 1907, 87.) G. Differs from the variety *pubescens* in having fewer central spines, which are hard. Mexico. (F. de Laet, Contich, Belgium.)

Mammillaria strobiliformis var. **pubescens.** (*M. K.* 1907, 87.) G. Radial spines 30 or more, hair-like, spreading, interlacing, snow-white; central 5–10, subulate, scarcely separated from the radial, forming an apparent crest at the summit of the stem, soft, coloured like the radial, but fox-red at the tips when young. Mexico. (F. de Laet, Contich, Belgium.)

Mammillaria strobiliformis var. **rufispina.** (*M. K.* 1907, 87.) G. Stem pale green, not gray. Tubercles more lax; furrows glabrous. Radial spines 15–20; central up to 5; all grayish, more or less fox-red at the tips. Flowers brownish. Mexico. (F. de Laet, Contich, Belgium.)

***Mesembryanthemum canum.** (*N. B.* iv. 248.) Ficoideae. G. Stem creeping, dichotomously divided, giving the plant a tufted appearance. Leaves 2–4, opposite, connate at the base, spreading and slightly recurved, nearly ovate, shortly acuminate or obtuse, narrowed towards the base, 1–1½ in. long, 5–7½ lin. broad. Flower solitary, with a short club-shaped stalk. Petals yellow, linear, obtuse, in 2 or 3 series. South Africa. (La Mortola.) [First introduced in 1795.]

Mesembryanthemum ramulosum. (*M. K.* 1907, 110.) G. A small tufted plant. Leaves connate in pairs, 3-angled, obtuse, gray-green, ¾ in. long. Peduncle 1¾–2 in. long, with 2 leaf-like bracts at the base. Flowers about 1 in. across. Calyx with 5 equal lobes. Petals in several series, acute, deep yellow. Filaments short. Styles 9. South Africa. (Cambridge B. G.)

Microstylis philippinensis. (*Orch.* ii. 16.) Orchidaceae. S. Leaves broadly oblong, bright green, somewhat undulate on the margin. Spike 8 in. long or more, many (about 100)-flowered. Flowers yellow or purplish. Sepals elliptic or almost orbicular, about 1¼ lin. long. Petals broadly oblong, somewhat shorter than the sepals. Lip orbicular in outline, deeply cordate at the base, 1½ lin. long, 1 lin. broad. Philippine Islands. (Erlangen B. G.)

Miltonia vexillaria Lambeauiana. (*G. C.* 1907, xlii. 117; *J. of H.* 1907, lv. 136.) Orchidaceae. S. Flowers pure white, with lemon-yellow crest. (Jules Hye de Crom, Conpure, Ghent.)

Narcissus Engleheartii. (*Gard.* 1907, lxxi. Nov. 30, vii.) Amaryllidaceae. H. A garden hybrid between a variety of *N. incomparabilis* and *N. poeticus*. (G. H. Engleheart.)

Nepenthes Pauli. (*R. H.* 1907, 9.) Nepenthaceae. S. A garden variety or hybrid of unrecorded parentage. (R. Jarry-Desloges, Paris.)

Nephrolepis exaltata superbissima. (*G. M.* 1907, 844, f.; *J. of H.* 1907, lv. 532, f.; *G. C.* 1907, xlii. 346). Filices. S. A very distinct variety, with cushion-like fronds about 12 in. long and 6 in. broad at the base. The pinnae curve upwards and over one another, some of them being almost at right angles to the plane of the frond. (F. R. Pierson & Co., Tarrytown, New York.) [Syn. *N. superbissima*; Gard. 1907, lxxi. 576, f.]

Nephrolepis exaltata Whitmani. (*G. C.* 1907, xli. 108; *J. of H.* 1907, liv. 238, f.; *R. H. B.* 1907, 159, f. 38, and t.) S. Intermediate between the varieties *elegantissima* and *todeaoides*. Its fronds are less plumose than in the latter, and the lobes of the pinnules are shorter and less acute. (H. B. May; H. Low & Co.). [Syn. *N. Whitmani*; G. M. 1907, 107, f.]

Nopalea guatemalensis. (*S. M. C.* l. 330, tt. 41, 42.) Cactaceae. G. An arborescent plant 15–22 ft. high, closely resembling an *Opuntia*; joints ovate to oblong, 6–8 in. long, blue-green, with numerous very spiny areolae. Spines 5–8, very unequal, the longest 1¼ in. long. Leaves linear, reflexed, acute. Sepals broadly ovate, thickened. Petals reddish (?), scarcely ½ in. long, erect. Guatemala. (Washington B.G.)

Nymphaea Baumii. (*Henk. Nymph.* 60.) Nymphaeaceae. S. The smallest species known. Leaves cordate-orbicular, ¾–1¼ in. across. Flowers ¾–1 in. across, white, slightly fragrant. Petals 7 or 8, lanceolate-elliptic. South West Tropical Africa. (F. Henkel, Darmstadt.)

Nymphaea Casparyi. (*Henk. Nymph.* 66, ff.) S. A new name for a plant in cultivation for many years as *N. gigantea*, but it differs from the true *N. gigantea*, Hook, in having smaller paler flowers, with less deeply cup-shaped petals. The leaves are thin, blue-violet beneath, deeply sinuate-toothed, with much longer teeth. Australia.

Nymphaea Henkeliana. (*Henk. Nymph.* 56, f.) S. Closely allied to *N. stellata*, but it differs in having the leaves sinuate on the margin and in the colour of the small flowers, which are white or pale rose. Probably Eastern India. (F. Henkel, Darmstadt.)

Nymphaea Holtzei. (*Henk. Nymph.* 67, ff.) S. A new species easily distinguished by its strikingly flat flowers. Leaves very thin, oval or almost orbicular, about 10 in. long and 8 in. broad, entire. Flowers pale blue, 4–5 in. across, having an odour of violets. Australia. (F. Henkel, Darmstadt.)

Nymphaea Holtzei var. **Eleonorae.** (Henk. Nymph. 68, f.) S. Flowers pure white. Melville Island, North Australia. (F. Henkel, Darmstadt.) [= *N. Holtzei* var. *albiflora*.]

Nymphaea rubra var. **Krumbiegelii.** (*Henk. Nymph.* 72, f.) S. A large-flowered variety, the flowers being bright red with dark red stamens. The leaves are green above and red beneath. Eastern India. (F. Henkel, Darmstadt.)

Odontioda Bradshawiae. (*G. C.* 1907, xli. 30, 36, f. 21; *O. R.* 1907, 40, 81, f. 9.) Orchidaceae. G. A garden hybrid between *Cochlioda Noetzliana* and *Odontoglossum crispum*. (Charlesworth & Co.)

Odontioda Devossiana. (*G. C.* 1907, xlii. 318; *G. M.* 1907, 804; *J. of H.* 1907, lv. 423, 529, f.; *O. R.* 1907, 363.) G. A garden hybrid between *Cochlioda Noetzliana* and *Odontoglossum Edwardii*. (H. Graire, Amiens.)

Odontoglossum Aliceae. (*G. C.* 1907, xli. 31, f. 15; *O. R.* 1907, 41, f. 5.) Orchidaceae. G. A garden hybrid between *O. Edwardii* and *O. crispo-Harryanum*. (J. G. Fowler.)

Odontoglossum auriferum. (*O. R.* 1907, 90.) G. A garden hybrid between *O. Hallii-xanthum* and *O. crispum*. (L. Linden & Co., Moortebeek, Brussels.)

Odontoglossum caeruleum. (*G. C.* 1907, xli. 354; *O. R.* 1907, 210, f. 25; *G. M.* 1907, 412, f.) G. A garden hybrid of doubtful parentage, but possibly between a form of *O. ardentissimum* and *O. crispum*. (Ch. Vuylsteke, Loochristi, Ghent.)

Odontoglussum caloglossum. (*G. C.* 1907, xli. 62; *O. R.* 1907, 53.) G. A garden hybrid between *O. crispum* and *O. Vuylstekeae*. (Ch. Vuylsteke, Loochristi, Ghent.)

Odontoglossum Cobbiae. (*O. R.* 1907, 83.) G. A garden hybrid between *O. amabile* and *O. Pescatorei*. (J. G. Fowler.)

Odontoglossum crispum album. (*J. of H.* 1907, liv. 307.) G. Flowers white, with a triangular yellow blotch on the base of the lip. (C. Pauwels, Ghent.)

Odontoglossum crispum callosum. (*R. H. B.* 1907, 203.) G. Flower of a good form and colour. (J. Hye de Crom, Conpure, Ghent.)

Odontoglossum crispum eminatum. (*O. R.* 1907, 27.) G. Sepals and petals broad, white, with dark blotches. (L. Linden & Co., Moortebeek, Brussels.)

Odontoglossum crispum Fowlerianum. (*G. C.* 1907, xli. 277, f. 115.) G. A fine variety distinguished by the clear whiteness of the flowers and the brightness of the ruby-crimson blotches with which the segments are heavily marked. Lip large, crimped at the margin, white, with a yellow crest and purple markings. (J. G. Fowler.)

Odontoglossum crispum heatonense. (*O. R.* 1907, 177.) G. "A particularly heavily blotched flower of fine shape." (Charlesworth & Co.)

Odontoglossum crispum Mossiae. (*G. C.* 1907, xli. 161; *G. M.* 1907, 178; *O. R.* 1907, 115.) G. A fine variety, having flowers with broad fringed segments, silver-white, slightly shaded with rose, the greater part marked with evenly distributed reddish purple blotches. (J. S. Moss.)

Odontoglossum Ernestii. (*O. R.* 1907, 158.) G. A garden hybrid between *O. triumphans* and *O. Adrianae*. (R. G. Thwaites.)

Odontoglossum Galpinianum. (*J. H. F.* 1907, 143.) Orchidaceae. G. A garden hybrid between *O. crispum* var. *guttatum* and *O. loochristiense*. (A. A. Peeters, Brussels.)

Odontoglossum gandavense. (*G. C.* 1907, xli. 353; *O. R.* 1907, 209, f. 23; *G. M.* 1907, 412.) G. A garden hybrid between *O. ardentissimum* and *O. Vuylstekeae*. (Ch. Vuylsteke, Loochristi, Ghent.)

Odontoglossum Kenchii. (*G. C.* 1907, xlii. 3.) G. A garden hybrid between *O. Kegeljani* and *O. Wilckeanum* var. *Mossiae*. (J. S. Moss.)

Odontoglossum Lansberghi. (*R. H. B.* 1907, 19.) G. A garden hybrid between *O. Wilckeanum* and *O. crispum*. (L. Linden & Co., Moortebeek, Brussels.)

Odontoglossum Pescatorei ornatum. (*G. C.* 1907, xlii. 254.) G. A form having large handsome flowers, the lip being densely covered with deep purple blotches. (J. & A. A. McBean.)

Odontoglossum tigrinum. (*O. R.* 1907, 158.) G. A garden hybrid between *O. Harryanum* and *O. Fascinator*. (R. G. Thwaites.)

Odontoglossum Watsonianum. (*R. H. B.* 1907, 20.) G. A garden hybrid between *O. crispum* and *O. Andersoni*. (L. Linden & Co., Moortebeek, Brussels.)

Odontonia Elwoodii. (*G. C.* 1907, xli. 108; *O. R.* 1907, 90.) Orchidaceae. G. A garden hybrid between *Odontoglossum cirrhosum* and *Miltonia Roezlii*. (Charlesworth & Co.)

Oenothera Havardi. (*G. M.* 1907, 317, as *O. Harvardi*.) Onagraceae. H. A small stemless plant covered with a whitish felt. Leaves in a rosette, grass-like. Flowers deep yellow, as large as those of *O. missouriensis*. Nevada and Texas.

Oldenlandia dolichantha. (*B. M.* t. 8165.) Rubiaceae. S. An erect annual herb about 1 ft. high. Stems quadrangular or slightly winged, branched. Leaves sessile, lanceolate, or shortly stalked and linear, 1–2 in. long. Flowers white, more or less green on the under side of the corolla-lobes, fragrant. Corolla with a slender tube about 4 in. long; limb nearly 1 in. across; lobes 4, lanceolate. East Tropical Africa. (Kew.)

Olearia chathamica. (*G. M.* 1907, 724.) Compositae. H.? A sparingly branched robust shrub. Leaves very coriaceous, obvate or oblong-lanceolate, 1–2 in. long, $\frac{1}{3}$–$\frac{2}{3}$ in. broad, acute, serrate; petiole short. Flower-heads few, on slender peduncles. Ray florets white. Disk-florets violet-purple. Chatham Island. (W. E. Gumbleton.) [See *Trans. New Zeal. Inst.* xxiii. 444.]

Olearia speciosa. (*B. M.* t. 8188.) G. A new species allied to *O. dentata*. A straggling shrub about 3 feet high. Branches densely tomentose. Leaves coriaceous, oblong-elliptic, $1\frac{1}{2}$–$2\frac{1}{2}$ in. long, $\frac{3}{4}$–$1\frac{1}{4}$ in. broad, densely tomentose beneath, denticulate. Flower-heads $\frac{2}{3}$ in. long, 1 in. across, in terminal lax corymbs; ray-florets 5 or 6, white, $\frac{1}{2}$ in. long. Australia. (Kew.) [Syn. *O. pannosa*, Hort.]

Oncidium longicornu var. **Grossmanni.** (*Orch.* i. 87.) Orchidaceae. G. Sepals rounded at the apex, pale yellow-green, as well as the petals. Lip only slightly 3-lobed, straw-coloured, with a broad pale brown blotch. South Brazil. (Berlin B. G.)

Onosma Thompsoni. (*J. of H.* 1907, lv. 440.) Boraginaceae. H. or H. H. A very beautiful species having linear-lanceolate leaves covered on the upper side with a white tomentum, and racemes of scarlet flowers borne on much branched stems. [*Echium rubrum*, Jacq.]

Opuntia Gosseliniana. (*M. K.* 1907, 68, f.) Cactaceae. G. A species growing 3 or 4 ft. high, probably allied to *O. albicans*, but flowers and fruit are at present unknown. In the long beautiful bristles with which the stem is provided it resembles *O. missouriensis* var. *trichophora*. Lower California. (Darmstadt B. G.)

Ouratea cuspidata. (*I. S. H. T.* vi. 65, t. 218.) Ochnaceae. S. A shrub 3–6 ft. high, with slender branches. Leaves alternate, shortly stalked, leathery, elliptic, 4–6 in. long. 2½–3¼ in. broad, minutely toothed, acute. Panicles terminal, simple or branched; branches angular. Flowers about ½ in. across, yellow; petals obovate, more or less crisped. Brazil. (L. van den Bossche, Tirlemont, Belgium.) [Syn. *Gomphia cuspidata*, St. Hil.]

Pachypodium Geayi. (*R. H.* 1907, 491, ff. 156, 157.) Apocynaceae. S. A curious tree attaining a height of 30–36 ft., with a succulent spiny *Cactus*-like stem, quite simple or shortly branched only at the summit, and having a terminal tuft of long narrow leaves. Madagascar. (Paris B. G.)

***Paeonia Cambessedesii.** (*B. M.* t. 8161.) Ranunculaceae. H. A herbaceous perennial. Leaves ternately pinnatisect; segments ovate-lanceolate or oblong, acute, entire, deep green above, purple beneath. Flowers solitary, deep rose-pink, about 3½ in. across. Carpels glabrous, purple, shining. Balearic Islands and Corsica. (Glasnevin B. G.)

Passiflora Allardii. (*G. C.* 1907, xlii. 274.) Passifloraceae. G. A garden hybrid between *P. quadrangularis* and *P. coerulea* 'Constance Elliott.' (Cambridge B. G.)

***Patrinia gibbosa.** (*G. C.* 1907, xlii. 197.) Valerianaceae. H. A small plant about 9 in. high, with the leaves swollen or blistered in places, and flat cymes of small yellow flowers. Japan. (S. Arnott.)

Pereskiopsis velutina. (*S. M. C.* l. 333, t. 44.) Cactaceae. G. Stems weak and spreading, forming compact bushes, the old ones with a cherry-brown bark; young branches borne nearly at right angles to the old stem, pubescent and bearing long white hairs, short spines, and bristles. Leaves broadly ovate, ¾–1¾ in. long. Flowers usually sessile on the second year's stems; bud ¾–1¼ in. long. Outer sepals green or deep red tinged with yellow. Petals bright yellow. The genus resembles *Pereskia* in habit and foliage and *Opuntia* in its flowers. Mexico. (Washington B. G.; New York B. G.)

Phaio-calanthe Colmanii. (*G. C.* 1907, xli. 31; *O. R.* 1907, 89, f. 10.) Orchidaceae. S. A garden hybrid between *Phaius* 'Norman' and *Calanthe Regnieri Stevensii*. (J. Coleman.)

Phaius amboinensis. (*O. R.* 1907, 284.) Orchidaceae. S. Resembles *P. flavus* in habit and in the general shape of the flowers, but these are white, with some veining on the lip. Malaya. (F. Sander & Sons.) [Syn. *P. Zollingeri*, Rchb. f.]

Philadelphus magnificus. (*M. D. G.* 1906, 52.) Saxifragaceae. H. A garden hybrid between *P. inodorus* and *P. latifolius*. (L. Späth, Berlin.)

Philadelphus venustus. (*M. D. G.* 1906, 53.) H. Leaves oblong-lanceolate, up to 1¾ in. long, gradually acuminate, subacute at the base, hairy both sides. Flowering-branches short. Raceme 3–5-flowered. Corolla scarcely 1 in. across, with oval petals. Eastern Tibet. (M. L. de Vilmorin, Les Barres, France.)

Phormium tenax Powerscourtii. (*G. W.* 1907, 3, f.) Liliaceae. H. Differs from the type in having narrower and much more rigid leaves; it is also hardier and blooms more freely. (Viscount Powerscourt.) [In cultivation for many years as the Powerscourt variety.]

Phyllocactus Darrahi. (*B. K.* t. 91.) Cactaceae. G. Closely related to *P. anguliger*. The segments of the stem are flat, thin, and broad, very coarsely toothed, and somewhat pale green. Flowers 9 in. long and 4½ in. across, with a fragrance resembling that of the Tuberose; tube greenish, nearly 6 in. long; outer segments yellow and the inner white. Mexico. (Berlin B. G.)

Phyllocactus Purpusii. (*M. K.* 1907, 34, f.) G. A new species allied to *P. grandis*. Plant erect, branched, forming a bush about 3 ft. high; branches large leaf-like, undulate, attenuated and obtuse at the apex. Flowers elongate-funnel-shaped, fragrant, when closed about 11 in. long. Outermost perianth-segments linear-lanceolate, carmine, passing to purple, with a median stripe darker outside and whitish inside; middle segments oblong to lanceolate, carmine-rose to white striped with rose, the inner shortly spinescent; innermost segments oblong, shortly spinescent, white tinted with rose, or yellowish white. Mexico. (Darmstadt B. G.)

Physoptychis gnaphalodes. (*Gard.* 1907, lxxi. 222, as *P. guavalodes.*) Cruciferae. H. A small alpine plant which in general appearance closely resembles an *Aubrietia*, but its foliage is greyer and its flowers are bright citron-yellow. Persia. (M. Leichtlin, Baden-Baden.) [Syn. *Vesicaria gnaphalodes*, Boiss.]

Physosiphon asaroides. (*Orch.* ii. 16.) Orchidaceae. G. Rhizome long, slender. Stems very short or almost none. Leaves triquetous, thick, lanceolate, up to 1¼ in. long, 3–4 lin. thick, usually reddish. Flowers solitary or in pairs, very shortly stalked, green-spotted and suffused with purple outside, dark purple inside. Tube of the sepals 1 in. long. Petals and lip 1–1½ lin. long. South Brazil. (Baron von Fuerstenberg, Schloss Hugenpoet, near Mintard, Germany.)

Picea excelsa interrupta. (*M. D. G.* 1906, 100.) Coniferae. H. A curious form in which the shoots of every second year are abnormally short, and are clothed with short broad almost scale-like leaves which lie close to the branches. Baron von Stauffenberg, Wilflingen, Württemberg.)

Picea excelsa nidiformis. (*M. D. G.* 1906, 87.) H. A form with a cushion-like habit. The short fan-shaped branches are horizontal, and arranged in dense layers, and through the absence of a central shoot the plant assumes a funnel-shaped or nest-like appearance. (R. Grisson, jr., Saselheide, Hamburg.)

Pilocereus Strausii. (*Gfl.* 1907, 410, f. 49.) Cactaceae. G. Stem columnar, up to about 3½ ft. high, cylindric, crowned with beautiful pure white silky shining soft hairs. Ribs about 25, not prominent. Areolae almost circular, about 2½ lin. apart, covered with a short pure white wool, and each bearing up to 40 white hairs about ¾ in. long, at first soft, afterwards stiffer. The older areolae have 4 reddish white spines, the lowermost of which are longest and about ¾ in. long. Bolivia. (Berlin B. G.; E. Heese, Gross Lichterfelde, near Berlin.)

Pinus montana aureo-variegata. (*M. D. G.* 1906, 193.) Coniferae. H. A form having some of the leaves golden-yellow. (Fritz Graf von Schwerin, Wendisch-Wilmersdorf, Germany.)

Pinus montana gracilis. (*M. D. G.* 1906, 193, f.) H. A slow- but regular-growing form, with leaves only 1–1½ in. long. (Fritz Graf von Schwerin, Wendisch-Wilmersdorf, Germany.)

Pinus silvestris crispata. (*M. D. G.* 1906, 192.) H. The long sickle-shaped leaves are each curved in a different direction and stand confusedly together, having a crisped appearance. (F. Graf von Schwerin, Wendisch-Wilmersdorf, Germany.)

Pinus silvestris nivea. (*M. D. G.* 1906, 191.) H. Leaves a dirty white-green. (F. Graf von Schwerin, Wendisch-Wilmersdorf, Germany.)

Pisonia Brunoniana. (*I. S. H. T.* vi. 9, t. 201, as *P. Brunonia.*) Nyctaginaceae. G. A tree reaching a height of nearly 50 ft. Leaves alternate, oval-oblong, up to about 10 in. long and 4 in. broad, acuminate, entire or sinuate; petiole somewhat thick, up to 1 in. long. Flowers very inconspicuous, in spreading terminal cymes. Tahiti and Marquesas Islands. L. van den Bossche, Tirlemont, Belgium.)

Pleurothallis Cogniauxiana. (*Orch.* ii. 28.) Orchidaceae. G. A new species resembling *P. prolifera*, but it is a somewhat taller plant with narrower leaves, and the outside of the flowers are densely hairy. Flowers pallid, densely covered with purple lines and spots. Sepals 4–4½ lin. long. Petals much smaller, cuneate, obtusely angled at the apex. Colombia. (O. Beyrodt, Marienfelde, Berlin.)

Pleurothallis dubia. (*Orch.* ii. 28.) G. A very small creeping plant. Stem 2-edged, 1-leaved. Leaf oblong or elliptic, obtuse, ¾ in. long, ¼ in. broad; petiole about ½ in. long. Flowers yellow, with a shining orange-yellow lip bearing brown papillae. Sepals oblong, acute, slightly more than ¼ lin. long. Petals lanceolate, much smaller. Lip simple, ovate-oblong. Mexico. (Munich B. G.)

***Podophyllum versipelle.** (*G. C.* 1907, xli. 365; *B. M.* t. 8154.) Berberidaceae. H. A perennial herb with stems nearly 3 ft. high, 2-forked at the top, each fork bearing a lobed peltate leaf 18–20 in. across. Flowers pendulous, deep crimson, about 1 in. long, borne in clusters of from 12 to 16 just under the leaves. Central China. (Kew; J. Veitch & Sons.)

Polycycnis Charlesworthii. (*G. C.* 1907, xlii. 154; *O. R.* 1907, 277; *G. W.* 1907, 612). Orchidaceae. S. Inflorescence long and arching, bearing about 50 flowers, each 1 in. across. Sepals broad, yellowish, closely mottled with pale red-brown, the upper abruptly turned back. Petals linear, twisted, yellow, slightly marked with red at the base. Lip long, narrow, brownish, with whitish hairs. British Guiana? (Charlesworth & Co.)

Polygonum Auberti. (*R. H.* 1907, 82, ff. 23, 24.) Polygonaceae. H. A vigorous-growing plant with climbing stems reaching a length of 7½–10 ft., becoming woody below. Leaves ovate-lanceolate, cordate at the base, reddish bronze or pale green with the apex red when young. Flowers small, greenish or rosy, in slender axillary panicles 6–8 in. long. The species resembles *P. baldschuanicum*, but is inferior to it. Western China. (Paris B. G.)

***Pouteria suavis.** (*K. B.* 1906, 365; *Jard.* 1907, 260.) Sapotaceae. G. A tree with straight somewhat slender flowering branches. Leaves crowded at the ends of the branches, shortly stalked, narrowly oblong to lanceolate, usually about 4 in. long and ½–1 in. broad, coriaceous. Flowers numerous, very small, in fascicles borne in the axils of the fallen leaves. Fruit pear-shaped, 1¾–2 in. long, with a thin edible pericarp possessing a delicate perfume. Uruguay. (Villa Garnier, Bordighera, Italy.)

Primula muscarioides. (*K. B.* 1907, 319; *B. M.* t. 8168.) Primulaceae. H. Leaves rather fleshy, obovate-spathulate, 4–5 in. long, crenate-dentate, scarcely stalked. Scape erect, almost twice as long as the leaves. Flowers very numerous, deflexed, in a very dense capitate spike 1–1½ in. long. Corolla narrowly funnel-shaped, scarcely 5 lin. long, deep purple-blue; lobes about half as long as the tube, subtruncate, almost erect, about 1½ lin. broad. China. (Bees, Ltd.)

Prunus Pissardi Hessei. (*M. D. G.* 1906, 42.) Rosaceae. H. Leaves narrow, irregularly cut and toothed, usually long-acuminate, red, with a broad greenish yellow or sometimes crimson-red border. (Darmstadt B. G.)

Prunus Pissardi Purpusi. (*M. D. G.* 1906, 42.) H. Leaves similar in shape to those of the type, dark red, variegated with yellow and bright rose. (Darmstadt B. G.)

Pterocactus decipiens. (*M. K.* 1907, 145.) Cactaceae. G. A shrubby plant with a subglobose tuber about 2½ in. in diam. Stem cylindric, slightly branched, up to 8 in. high. Areolae orbicular to elongate, woolly. Radial spines 20–25, white, up to 3½ lin. long; central 2 or 3, pale brown, 2–3½ lin. long. Flowers terminal, about 2 in. long; segments lanceolate-spathulate, mucronate, yellow. Stigmas 5, purple. Seeds broadly winged. Argentina. (Berlin B. G.)

Pterocactus Kuntzei. (*M. K.* 1907, 137.) G. A small tufted glaucescent shrub. Branches short, slender, somewhat club-shaped. Spines very small, 9–12, adpressed. Flowers terminal, altogether scarcely 1 in. long, and about the same across, yellow. Argentina. (Haage & Schmidt, Erfurt.)

Pteronia incana. (*R. H.* 1907, 151.) Compositae. H. or H. H. A small graceful much branched shrub, covered with a grey tomentum. Leaves in whorls, small, linear-oblong. Flower-heads golden-yellow. South Africa. (J. Navello, La Selva, Nice.)

***Pycnostachys Dawei.** (*G. C.* 1907, xli. 18.) Labiatae. G. A stout herb 4–6 ft. high, with a loosely-branched pyramidal habit. Leaves narrowly lanceolate, 5–12 in. long, ½–1½ in. broad, acuminate, serrate. Flowers many, crowded, in short spikes terminating all the branches. Calyx-teeth needle-like, ciliate with long hairs. Corolla about ⅝ in. long, cobalt-blue. Uganda. (Kew.)

Rhipsalis pilocarpa. (*M. K.* 1907, 182; *B. K.* t. 99.) Cactaceae. S. Branches terete, thickly covered with areolae, each of which bears a bundle of 10–15 white bristles up to 2½ lin. long. Flowers terminal, wheel-shaped, 1 in. across. Petals lanceolate, 20–25, acute, pale yellow, becoming slightly green, the outer suffused with a delicate rose at the apex. Brazil. (Berlin B. G.)

Rhipsalis Simmleri. (*B. H. B.* 1907, 136, ff.) S. Stem slender, cylindric, more or less pendulous, very much branched; branches dichotomous or in whorls of 3 or 4, ½–1¼ in. long, 5-angled or somewhat ribbed. Flowers solitary, almost terminal. Petals white, red at the apex, the outer scale-like and very small, the inner oblong-spathulate, ¼–⅓ in. long. Costa Rica. (W. Barbey, Pierrière, Geneva.)

Rhododendron Benthamianum. (*K. B.* 1907, 319.) Ericaceae. H. A new species resembling *R. yunnanense*, from which it differs in the more densely lepidote leaves and in having purple-violet flowers, which are usually in threes, and about 2½ in. across. Western China. (J. Veitch & Sons.)

Rhododendron chartophyllum. (*R. H.* 1907, 248 ; *J. H. F.* 1907, 197.) G. Allied to *R. yunnanense*, but the leaves are narrower and are not ciliate. Flowers numerous, broadly funnel-shaped, 1¼-1¾ in. long, violet-rose or white.) South China. (M. L. de Vilmorin, Les Barres, France.

***Rhododendron intricatum.** (*G. C.* 1907, xli. 262, f. 111 ; *B. M.* t. 8163.) H. A densely branched shrub 1–3 ft. high, flowering when only a few inches high. Leaves persistent, crowded, small (½ in. long or less), oblong, densely clothed with small peltate scales on both sides. Flowers usually in clusters of 5, lilac or almost violet in colour. Stamens included, the yellow anthers just protruding from the tube of the corolla. Western China. (J. Veitch & Sons.) [This is the plant referred to in *G. C.* 1907, xli. 225, and in *J. of H.* 1907, liv. 343, under the erroneous name of *R. nigro-punctatum.*]

***Rhododendron Kaempferi.** (*Sargent, T. & S.* ii. 29, t. 113.) H. Differs from typical *R. indicum* (*Azalea indica*) in having deciduous elliptic sometimes nearly rhombic or elliptic-ovate leaves, smaller flowers in 2–4-flowered umbels, and only 5 (not 5–10) stamens with yellow instead of purple anthers. First introduced into America in 1892. Japan. (Arnold Arboretum.) [Syn. *R. indicum* var. *Kaempferi*, Maxim. ; *R. Sieboldi*, Miq., &c.]

***Rhododendron Mariesii.** (*K. B.* 1907, 244.) H. H. or H. A new species of the section *Azalea*. A bush 3–7 ft. high. Leaves clustered, deciduous, membranous, ovate, 2½–3 in. long, 1–1½ in. broad, acute, hairy when young ; petiole 2–4 lin. long. Buds ovoid ; scales broadly ovate or orbicular. Flowers usually in pairs, rarely solitary, pale purple, 1¾–2 in. across. Calyx annular, densely setose. Corolla deeply 5-lobed. Central China. (Kew.)

Rhus typhina filicina. (*B. T. C.* 1907, 248.) Anacardiaceae. H. The leaves of this variety are about 3 ft. long, with 23 pairs of leaflets, which are more or less deeply incised. (C. Sprenger, Naples.)

***Rhus typhina laciniata.** (*R. H.* 1907, 10, ff. 1, 2.) H. The leaves have 6–10 pairs of very much laciniated leaflets. (Barbier & Co., Orleans.)

Rhynchanthus Johnianus. (*Gfl.* 1907, 113, t. 1560.) Scitamineae. S. Stem about 5 ft. high. Leaves in 2 rows, lanceolate, acuminate, 8–10 in. long, 1¾–2½ in. broad. Inflorescence elongated, many-flowered. Bracts red, lanceolate, acuminate. Corolla yellow, slightly longer than the bracts, divided to below the middle into 3 narrow acuminate segments. Moulmein. (K. W. John, Andernach on the Rhine, Germany.)

***Ribes mogollonicum.** (*B. M.* t. 8120.) Saxifragaceae. H. A robust shrub with a habit resembling that of *R. sanguineum*. Leaves suborbicular, usually 5-lobed, 1–3 in. across. Flowers small greenish white, in straight erect or suberect dense racemes. Berries ovoid-globose, purplish or bluish-black, about ⅛ in. across, edible. South-western United States. (Kew.)

***Rindera umbellata.** (*G. C.* 1907, xlii. 226, ff. 97, 98.) Boraginacea. H. Stem erect, 1–2 ft. high. Basal leaves tufted, evergreen, oblong-lanceolate to ovate-lanceolate, long-stalked ; cauline leaves lanceolate, with a winged petiole or sessile, all entire, grey-pubescent. Flowers in scorpioid cymes umbellately arranged. Calyx densely woolly, 5-partite. Corolla tubular, scarcely ½ in. long, reddish yellow or dark brown ; lobes erect, oblong. Nutlets ovate-orbicular, broadly winged. Hungary ; Servia. (T. Smith.) [Syn. *Cynoglossum umbellatum*, Waldst. & Kit. ; *Mattia umbellata*, Schultes.]

Rosa Willmottiae. (*K. B.* 1907, 317.) H. A new species allied to *R. Webbiana*. A densely branched shrub 5–10 ft. high, except the glandular-ciliate stipules almost quite glabrous. Branches brown-red. Spines on the flowering branches in pairs, straight, 4–5 lin. long, pallid. Leaves crowded, ¾–1¼ in. long ; stipules minute, free above the middle. Flowers rose-lilac or rose-purple, 1½–1¾ in. across, solitary at the ends of the shorter branches. Sepals lanceolate, entire, about 5 lin. long. Petals almost entire. Styles free. China. (J. Veitch & Sons.)

Rubus flagelliflorus. (*Veitch Nov.* 1907, 7, f.; *Gard.* 1907, lxxi, 237, as *R. flagelliformis.*) Rosaceae. H. Almost evergreen, and remarkable for the metallic appearance of the leaves during the summer. The young shoots and the under surface of the cordate acuminate leaves are covered with a thick dun-coloured tomentum. Flowers white, borne on growths 6–8 ft. long. Central China. (J. Veitch & Sons.)

***Salvia cyanea.** (*Jard.* 1907, 146.) Labiatae. G. Stems quadrangular, slightly winged. Leaves obovate, toothed, glabrous, beautiful bright green; petiole rather long. Flowers small, sky-blue. in long terminal panicles. A winter-flowering species. Central America.

Salvia princeps. (*R. H. B.* 1907, 257, f. 52 & col. t.) A shrubby winter-flowering species resembling *S. splendens.* The plant attains a height of 5–7 ft. Leaves large, ovate, serrate, with the principal veins prominent. Flowers a brilliant crimson-rose, in large spikes terminating the branches. Corolla much longer than the calyx, slightly ventricose; lips small. Mexico. (Besson frères, Nice.)

***Salvia Souliei.** (*Veitch Nov.* 1907, 11, f.; *Gard.* 1907, lxxi. 237.) H. A handsome perennial herb, 2 ft. high. Leaves dark green, rugose, triangular. Flower-stems 2 ft. high. Flowers numerous, tubular, of a delicate shade of blue. Western China. (J. Veitch & Sons.)

***Saxifraga Aizoon lutea.** (*G. C.* 1907, xlii. 28.) Saxifragaceae. H. Flowers at first primrose-yellow changing to a creamy-yellow.

***Saxifraga Aizoon rosea.** (*G. C.* 1907, xli. 358, 418; *Gard.* 1907, lxxi. 292; *G. M.* 1907, 412, 493.) H. Differs from the type in having bright pink flowers. (R. Farrer; S. Arnott.)

***Saxifraga Brunoniana.** (*G. C.* 1907, xlii. 48.) H. Remarkable for its numerous crimson thread-like stolons. Leaves narrow, in rosettes, similar to those of *S. aizoides.* Flowers yellow. Himalaya. (Kew.)

***Saxifraga gemmipara.** (*G. C.* 1907, xlii. 292.) H. H. Similar to the species included in the section to which *S. aizoides* belongs. It is of tufted habit, only 1 or 2 in. high. Leaves ½–¾ in. long, ¼ in. broad, densely covered with long hairs. Flowers white, about ¼ in. across, with prominent orange-coloured stamens. Yunnan, China. (Bees, Ltd.)

***Saxifraga tellimoides.** (*J. H. F.* 1907, 402; *B. S. B. F.* 1904, *Append.* 128.) H. Leaves long-stalked, almost peltate, deeply lobed. Flowers white or yellowish, rather large, in a pedunculate cyme. Japan. (Ph. L. de Vilmorin, Verrières, France.)

Solanum texanum tricolor. (*O. G. Z.* 1907, 65, f. 11.) Solanaceae. G. Fruits changing in colour from white to an intense yellow, then to a bright scarlet-red. (M. Herb, Naples.)

Sophro-cattleya Heathii. (*O. R.* 1907, 91.) Orchidaceae. G. A garden hybrid between *Sophronitis grandiflora* and *Cattleya Schroederae.* (Heath & Sons.)

Sorbus maderensis. (*B. S. D. F.* 1907, 206, f.) Rosaceae. H. Very similar to *S.* (*Pyrus*) *Aucuparia*, but the leaves are smaller, with sessile leaflets rounded at the apex and glabrescent in the adult stage. Inflorescence much more compact. Madeira. (L. A. Dode, Paris.) [Syn. *S. Aucuparia*, Linn., var. *maderensis*, Lowe.] [*Pyrus.*]

Sorbus reflexipetala. (*M. D. G.* 1906, 58.) H. Younger branches sparingly pilose at the apex. Buds somewhat viscous. Rhachis of the leaf at first sparingly pilose, afterwards glabrous; leaflets 11–17, mostly oblong lanceolate, 1¼–2 in. long, very acute or shortly acuminate, coarsely toothed, almost glabrous. Corymb glabrous. Corolla 2½–3 lin. across. Petals reflexed. Probably Japan. (L. Späth, Berlin.) [*Pyrus.*]

Sorbus serotina. (*M. D. G.* 1906, 59.) H. Younger branches quite glabrous. Buds somewhat viscous. Rhachis of the leaf at first covered with long ferruginous hairs, afterwards glabrous; leaflets 9–13, oblong-lanceolate or oblong, long-acuminate, 1½–2 in. long, toothed. Corymb densely pilose. Corolla 2½–3 lin. across. Petals reflexed. Probably Japan. (L. Späth, Berlin.) [*Pyrus.*]

Spiraea Aruncus var. **plumosa.** (*G. C.* 1907, xlii. 244.) Rosaceae. H. Much dwarfer than the type. Stems and leaf-stalks reddish. Leaves pale nut-green, the lobes minutely serrulate. Flowers white, in an elegant panicle 2 ft. long.

Spiraea gigantea rosea. (*Gard.* 1907, lxxi. 418, f.) H. The plant grows 6 ft. high or more, and has very large leaves and large spreading heads of bright rose flowers. (A. Perry.) [Syn. *S. camtschatica rosea*; *G. C.* 1907, xlii. 76; *G. M.* 1907, 568; *G. W.* 1907, 545.]

Stauropsis luchuensis. (*K. B.* 1907, 131.) Orchidaceae. G. A scandent herb with stems 1 ft. long. Leaves distichous, oblong, very shortly 2-lobed, 4–6 in. long, ¾–1¼ in. broad. Scapes suberect, 6–16 in. long. Raceme many-flowered. Flowers showy, yellow, with brown spots. Sepals obovate-oblong, 6–8 lin. long. Petals somewhat narrower than the sepals. Lip fleshy, slightly 3-lobed. 7½ lin. long, saccate at the base. Luchu Archipelago. (Cultivated in Japan.)

Streptocarpus Junodii. (*B. H. B.* 1907, 699, 1013, ff.) Gesneraceae. G. Stemless. Leaves 4–6, rugose, usually narrowed at the base, villose, with the veins on the underside thick, prominent, and densely villose. Peduncles erect, 3–5 in. high, 3–6-flowered. Flowers pendulous, 1¾–2 in. long, blue-lilac, with the median lower lobe of the corolla-limb marked at the base with a linear citron-yellow blotch. Transvaal. (W. Barbey, Pierrière, Geneva.)

Strobilanthes Micholitzi. (*G C.* 1907, xli. 246.) Acanthaceae. S. A half-shrubby plant 3–4 ft. high. Stem 4-angled, dilated at the nodes. Leaves lanceolate or ovate-lanceolate, 6 in. long, 2 in. broad, one much larger than the other, acuminate at both ends; petiole 1 in. long; racemes axillary, very numerous, cone-like, ½–¾ in. long; bracts rounded, white tipped with green. Flowers white, shortly projecting from the cone. Sumatra. (F. Sander & Sons.)

***Tamarix pentandra.** (*B. M.* t. 8138.) Tamaricaceae. H. A very decorative species differing from *T. gallica* in the persistent connivent petals and in the filaments, which are not wider at the base, arising between the lobes of the disk. South-Eastern Europe and the Orient. (Kew.) [Syn. *T. Pallasii*, Desv.]

Tellima affinis. (*Jard.* 1907, 28, f. 18.) Saxifragaceae. H. H. A tuberous-rooted plant with long rigid stems, lobed bright green leaves and small graceful white flowers. California. (Ph. Rivoire, Lyons, France.)

***Thalictrum dipterocarpum.** (*Veitch Nov.* 1907, 9, f.; *Gard.* 1907, lxxi. 237.) Ranunculaceae. H. A robust species with an elegant habit and prettily divided leaves. Flowering-stems 4–5 ft. high. Flowers rose-purple, with yellow anthers. Western China. (J. Veitch & Sons.)

Thuyopsis dolabrata altissima. (*M. D. G.* 1906, 145.) Coniferae. H. Vigorous, with an almost columnar habit; branches short and heavy, hanging over prettily. (C. Ansorge, Klein Flottbek, Hamburg.)

Thuyopsis dolabrata cristata. (*M. D. G.* 1906, 145.) H. The plant is depressed-globose, with compact broadly fan-shaped ascending branches, which are very full and somewhat crisped. (C. Ansorge, Klein Flottbek, Hamburg.)

Thuyopsis dolabrata plicata. (*M. D. G.* 1906, 145.) H. Very vigorous, with heavy branches which hang over and appear folded. (C. Ansorge, Klein Flottbek, Hamburg.)

***Tiarella unifoliata.** (*G. M.* 1907, 452.) Saxifragaceae. H. More robust than *T. cordifolia*, sometimes attaining a height of 3 ft. Flowers rose-tinted, in pretty spikes. North-West America. (Craven Nursery Co.; S. Arnott.)

***Tricholepis furcata.** (*I. S. H. T.* vi. 23, t. 207.) Compositae. H. or H. H. A glabrous or puberulous herb. Stem 1¾–5½ ft. high, branched from the base. Leaves shortly stalked, elliptic-lanceolate, 2–6 in. long, ¾–2½ in. broad, acute or acuminate, denticulate. Flower-heads rather large, yellow, solitary at the ends of the branches, with needle-like involucral bracts. Himalaya. (Kew; L. van den Bossche, Tirlemont, Belgium.) [Syn. *Carduus trichocephalus*, Wall.]

***Tricuspidaria dependens.** (*B. M.* t. 8115.) Tiliaceae. G. A small compact tree. Leaves obovate or elliptic or sometimes ovate, ¾–2½ in. long, ½–1¼ in. broad, serrate. Flowers 1–3 together, axillary, borne on long curved peduncles. Petals oblong, white, about ¾ in. long, 3-toothed at the apex. This is the true *T. dependens*, Ruiz & Pav. The plant under this name in *Bot. Mag.* t. 7160, is *T. lanceolata*, Miq. Central Chili. (Kew.)

Tritoma rufa var. **venusta.** (*R. H.* 1907, 304, t.) Liliaceae. H. Scape long and very straight. Flowers a beautiful bright yellow. (Ph. L. de Vilmorin, Verrières, France.) [*Kniphofia rufa* var.]

***Trollius chinensis.** (*G. W.* 1907, 283, f.) Ranunculaceae. H. Plant about 2 ft. high, with leaves similar to those of the other species in cultivation. Flowers flat (not globular), the golden-yellow sepals spreading horizontally. Petals long and narrow, standing up conspicuously in the centre of the flower. China. (Kew.)

Ulmus japonica. (*Sargent, T. & S.*, ii. 1, t. 101.) Urticaceae. H. A new species resembling *U. americana* in habit, foliage, and pubescence. A tree 65–90 ft. high, with a trunk often 3–4 ft. in diam. Branches gracefully pendent, with slender slightly zigzag branchlets, pale yellow-green during their first season, becoming deeper coloured. Winter-buds obtusely conical. Leaves oblong-obovate, 3–6 in. long, 1½–3 in. broad, unequal at the base, coarsely toothed. Flowers nearly sessile, light red. Fruit narrowly oblong-obovate. Japan. (Arnold Arboretum.)

Vernonia gigantea. (*R. H.* 1907, 468.) Compositae. H. A robust plant with very large panicles of carmine or violet-rose flower-heads. (H. Correvon, Floraire, Geneva.)

Viburnum cinnamomifolium. (*Sargent, T. & S.* ii. 31, t. 114.) Caprifoliaceae. H. A glabrous shrub or small tree with dark reddish brown branches. Leaves leathery, persistent, elliptic-oblong, 3–5 in. long, 1¼–2 in. broad, long-acuminate, entire or with a few small teeth near the apex, conspicuously 3-nerved; petioles stout, ½–1 in. long. Flowers small, greenish white, in large loose umbel-like corymbs. Mt. Omei, Western China. (J. Veitch & Sons.)

Viburnum propinquum. (*Sargent, T. & S.* ii. 33, t. 115.) H. A shrub with reddish brown lustrous branches. Leaves handsome, evergreen, elliptic to elliptic-oblong or ovate to ovate-lanceolate, 1¾–4 in. long, ¾–1½ in. broad, remotely toothed, glabrous, conspicuously 3-nerved, with slender petioles up to ⅔ in. long. Flowers small, greenish white, in small umbel-like terminal corymbs. Central and Western China. (J. Veitch & Sons.)

***Viburnum utile.** (*G. C.* 1907, xli. 381.) H. An extremely floriferous species. Stems stellate-tomentose when young, glabrous when mature. Leaves shortly stalked, thick, lanceolate-oblong or ovate-lanceolate, 1–1½ in. long, ¾–1 in. broad, obtuse, entire. Flowers pure white, ½ in. across, in dense corymbose cymes about 3 in. across. Central China. (J. Veitch & Sons.)

Victoria Cruciana var. **Malmei.** (*Henk. Nymph.* 43.) Nymphaeaceae. S. A very robust variety. The strong ribs of the margin of the leaf, which is strikingly ventricose, are pale rose to dark rose, with the intermediate tissue green. Brazil. (Stockholm B. G.; F. Henkel, Darmstadt.) [*V. regia*, Lindl. var.]

Vitex littoralis. (*B. P.* vi. 86, t. 2.) Verbenaceae. G. A tree 18 ft. high or more, with a hard durable wood. Leaves dark green, long-stalked, the lower with 3, the upper with 5 leaflets which are elliptic, obtusely acuminate and glabrous. Flowers in a short racemose panicle. Corolla bright rose, about 1 in. long, 2-lipped. New Zealand. (Palermo B. G.)

***Vitis Pagnucci.** (*G. M.* 1907, 797.) Ampelidaceae. H. A slender-growing densely branched plant. Leaves small, few-lobed, bronze-coloured in autumn. China. (Kew.)

***Vitis semicordata.** (*G. M.* 1907, 797, as *V. semicaudata*.) H. A self-clinging species. Leaves long-stalked, 3-lobed, dark green above, paler reddish and pubescent beneath; leaflets ovate, with a slender tapering apex. Himalaya and Khasia Mts. [= *V. himalayana*, Brand., var. *semicordata*, Wall.]

Woodwardia paradoxa. (*G. C.* 1907, xli. 98.) Filices. G. A new species resembling *W. radicans*, but it has narrower fronds, and the veinlets are perfectly free from the sorus to the margin. The fronds are 3 ft. long and 9 in. broad in the middle, quite glabrous and destitute of scales; pinnae lanceolate, about 6 in. long and 1½ in. broad. Small island near Vancouver Island. (Glasnevin B. G.)

Zaluzianskia maritima. (*G. C.* 1907, xlii. 161, f. 64.) Scrophulariaceae. G. A viscid herb somewhat shrubby at the base. Stem up to about 15 in. high, leafy. Leaves linear to oblong, sessile, entire or few-toothed. Flowers in the axils of the uppermost leaves. Corolla with a slender reddish or purplish tube 1–1½ in. long; lobes of the limb bifid, reddish or purplish outside, white inside; they expand at night or in imperfect light. South Africa. (W. E. Gumbleton.) [Not the true *Zaluzianskya maritima*, Walp., but *Z. lychnidea*, Walp.]

Zephyranthes candida var. **major.** (*Gard.* 1907, lxxi. 515.) Amaryllidaceae. H. Flowers 4 in. long, borne on long stout stems Uruguay. (Kew.)

ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

APPENDIX IV.—1908.

LIST of STAFFS of the ROYAL BOTANIC GARDENS, Kew, and of Botanical Departments, Establishments and Officers at Home, and in India and the Colonies, in Correspondence with Kew.

* Trained at Kew. † Recommended by Kew.

Royal Botanic Gardens, Kew.—

Director - - - - -	Lieut.-Col. D. Prain, I.M.S., C.I.E., M.A., M.B., LL.D., F.R.S., F.L.S.
Assistant Director - - -	Arthur W. Hill, M.A., F.L.S.
Assistant (Office) - - -	*John Aikman.
„ „ - - -	*William Nicholls Winn.

Keeper of Herbarium and Library	*William Botting Hemsley, F.R.S., F.L.S.
Principal Assistant (Phanerogams)	Otto Stapf, Ph.D., F.R.S., F.L.S.
„ „ (Cryptogams) -	George Massee, F.L.S.
Assistant (Herbarium) - -	Nicholas Edward Brown, A.L.S.
„ „ - -	*Robert Allen Rolfe, A.L.S.
„ „ - -	Charles Henry Wright, A.L.S.
„ „ - -	*Sidney Alfred Skan.
„ „ - -	Thomas Archibald Sprague, B.Sc., F.L.S.
„ „ - -	Arthur Disbrowe Cotton, F.L.S.
„ for India - - -	*John Hutchinson.

Assistant (Jodrell Laboratory) - Leonard Alfred Boodle, F.L.S.

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Royal Botanic Gardens, Kew—*continued.*

Keeper of Museums	John Masters Hillier.
Assistant (Museums)	*John H. Holland, F.L.S.
Preparer	George Badderly.

Curator of the Gardens	William Watson, A.L.S.
Assistant Curator	*William J. Bean.
Foremen :—	
Herbaceous Department	*Walter Irving.
Arboretum	*William Dallimore.
Greenhouse and Ornamental Department.	*Arthur Osborn.
Tropical Department	*Charles P. Raffill.
Temperate House	*William Taylor.
Storekeeper	*George Dear.

Cambridge.—University Botanical Department :—

Professor	A. C. Seward, M.A., F.R.S., F.L.S.
Curator, University Herbarium.	C. E. Moss, D.Sc.
Curator, University Museum.	E. R. Burdon, M.A., F.L.S.
Curator of Garden	*Richard Irwin Lynch, M.A., A.L.S.

Dublin.—Royal Botanic Gardens, Glasnevin :—

Keeper	Frederick W. Moore, A.L.S.
Assistant	*C. F. Ball.

Trinity College Botanic Gardens :—

Professor	H. H. Dixon, Sc.D., F.R.S.

Edinburgh.—Royal Botanic Garden :—

Regius Keeper	Isaac Bayley Balfour, M.D., Sc.D., F.R.S., F.L.S.
Assistant (Museum)	H. F. Tagg, F.L.S.
„ (Herbarium)	*J. F. Jeffrey.
Head Gardener	*R. L. Harrow.
Assistant Gardener	Henry Hastings.

Glasgow.—Botanic Gardens :—

University Professor	F. O. Bower, M.A., Sc.D., F.R.S., F.L.S.
Curator	James Whitton.

Liverpool.—University Botanical Department :—

	Professor - - -	R. J. Harvey Gibson, M.A., F.L.S.

Oxford.—University Botanic Garden :—

	Professor - - -	SydneyH.Vines,M.A., Sc.D., F.R.S., F.L.S.
	Curator - - -	*William Baker.

AFRICA.

British East Africa Protectorate.—

Nairobi -	Director of Agriculture.	A. C. Macdonald.
	Assistant - - -	*Henry Powell.
	Conservator of Forests	D. E. Hutchins.

Cape Colony.—

Cape Town -	Hon. Curator, Government Herbarium.	Prof. Pearson, M.A., F.L.S.
	Conservator of Forests	J. S. Lister.
	Gardens and Public Parks :—	
	Superintendent - -	H. J. Chalwin.

Grahamstown.—Albany Museum :—

	Director - - -	S. Schönland, Ph.D., F.L.S.
	Gardens and Public Parks :—	
	Curator - - -	Edwin Tidmarsh.
Port Elizabeth -	Superintendent - -	John T. Butters.
King Williamstown.	Curator - - -	George Lockie.
Graaff-Reinet -	„ - - -	*C. J. Howlett.
Uitenhage -	„ - - -	H. Fairey.

Egypt.—

Cairo.—Khedivial Agricultural Society :—

	Secretary - - -	G. P. Foaden, B.Sc.

Gold Coast.—Botanic and Agricultural Department :—

	Director of Agriculture.	——
	Travelling Instructor	*Alfred E. Evans.

Gold Coast.—Botanic and Agricultural Department—*continued.*

	Curator	*James Anderson.
	„	*K. G. Burbridge.
	„	A. F. Gear.
	„	F. De Valda.
	„	*Robert Band.

Natal.—Botanic Gardens :—

Durban	Director	John Medley Wood, A.L.S.
	Curator	*James Wylie.

Northern Nigeria.—

Conservator of Forests	——

Nyasaland Protectorate.—

Forestry and Botanical Department :—

Zomba	Head of Department	*J. M. Purves.
	Forester	*E. W. Davy.

Orange River Colony.—Department of Agriculture :—

Chief of Forestry Division.	K. A. Carlson.

Rhodesia.—

Bulawayo.—Rhodes Matopo Park :—

Curator	W. E. Dowsett.

Salisbury.—Department of Agriculture :—

Director	Dr. A. E. Nobbs.
Assistant	*C. E. F. Allen.

Sierra Leone.—Botanic Station :—

Agricultural Superintendent	*C. W. Smythe.

Soudan.—

Khartoum	Director of Woods and Forests.	A. F. Broun.
	Superintendent of Palace Gardens.	*F. S. Sillitoe.
Jebelin	Superintendent of Experimental Plantations.	*T. Cartwright.

Southern Nigeria.—Agricultural Department :—

Curator	*William Don.
„	*H. Dodd.
„	*J. L. Williams.
„	*A. Hislop.
Assistant	*T. B. Dawodu.
Conservator of Forests	H. N. Thompson.

Transvaal.—Department of Agriculture :—

Pretoria - -	Botanist - - -	J. Burtt Davy, F.L.S.
	Mycologist - -	†I. B. Pole Evans, B.Sc., F.L.S.

Uganda.—Scientific and Forestry Department :—

Entebbe - -	Director - - -	*M. T. Dawe, F.L.S.
	Assistant - - -	*Robert Fyffe.

Zanzibar - -	Director of Agriculture	R. N. Lyne, F.L.S.
	Dunga Experimental Station :—	
	Superintendent -	W. Buzzacott.

AUSTRALIA.

New South Wales.—Botanic Gardens :—

Sydney - -	Director and Government Botanist.	J. H. Maiden, F.L.S.
	Superintendent -	George Harwood.
	Botanical Assistant -	E. Betche.
	Technological Museum :—	
	Curator - - -	R. T. Baker, F.L.S.

Queensland.—

Brisbane - -	Colonial Botanist -	F. M. Bailey, F.L.S.
	Botanic Gardens :—	
	Director - - -	J. F. Bailey.
	Acclimatisation Society's Gardens :—	
	Secretary - - -	H. J. Johnson.
	Overseer - - -	James Mitchell.
	Forest Department :—	
	Director - - -	*Philip MacMahon.
Cairns.—Kamerunga State Nursery :—		
	Manager - - -	Howard Newport.
	Overseer - - -	J. G. Malcolm.
Rockhampton -	Superintendent - -	R. Simmons.

South Australia.—Botanic Gardens :—

Adelaide - -	Director - - -	Maurice Holtze, Ph.D., F.L.S.
Port Darwin -	Curator - - -	Nicholas Holtze.
	Woods and Forests :—	
	Conservator - -	Walter Gill, F.L.S.

Tasmania.—

Hobart Town -	Government Botanist	Leonard Rodway.
	Chief Forests Officer -	J. C. Penny.
	Botanic Gardens :—	
	Director - - -	Alex. Morton.

Victoria.—Botanic Gardens :—

Melbourne -	Director - - -	W. R. Guilfoyle.
	National Herbarium :—	
	Government Botanist-	A. J. Ewart, D.Sc., Ph.D., F.L.S.
	Acting Conservator of Forests -	A. W. Crooke.

BERMUDA.

Botanic Station :—

Superintendent - - - - *Thomas J. Harris.

BRITISH HONDURAS.

Botanic Station :—

Curator - - - - - - Eugene Campbell.

CANADA.

Ottawa - -	Dominion Botanist -	Prof. John Macoun, M.A., F.R.S.C.
	Assistant „ -	Jas. M. Macoun.
	Director of Government Experimental Farms.	Prof. Wm. Saunders, C. M. G., LL.D., F.R.S.C., F.L.S.
	Director's Assistant and Superintendent of Botanic Garden.	W. T. Macoun.
	Botanist and Entomologist.	James Fletcher, F.R.S.C., F.L.S.
Montreal -	Professor of Botany, McGill University.	Prof. D. P. Penhallow B.Sc., F.R.S.C.

CEYLON.

Peradeniya.—Royal Botanic Gardens :—

Director	†John C. Willis, Sc.D., F.L.S.
Assistant Director	R. H. Lock, M.A.
Government Mycologist	†T. Petch, B.A., B.Sc.
Scientific Assistant	A. M. Smith, B.A.
Superintendent, Experiment Station	——
Curator	*Hugh F. Macmillan, F.L.S.
Superintendent of School Gardens	C. Drieberg, B.A.

Hakgala	Curator	J. K. Nock.
Heneratgoda	Conductor	H. W. Perera.

Maha-iluppalama.—Experiment Station :—

Superintendent	C. J. C. Mee, F.L.S.

Nuwara Eliya	Conductor	D. Michael.
	Conservator of Forests	T. J. Campbell.

CYPRUS.

Principal Forest Officer	A. K. Bovill.
Director of Agriculture	D. Saracomenos.

FALKLAND ISLANDS.

Government House Garden :—

Head Gardener	*Albert Linney.

FIJI.

Superintendent of Agriculture	Charles H. Knowles.

Botanic Station :—

Curator	*Daniel Yeoward.

HONG KONG.

Botanic and Afforestation Department :—

Superintendent	*S. T. Dunn, B.A., F.L.S.
Assistant Superintendent	*W. J. Tutcher, F.L.S.

MALTA.

Argotti Botanic Garden :—

Director - - - - - - Dr. Francesco Debono.

MAURITIUS.

Pamplemousses.—Department of Forests and Botanic Gardens :—

Director - - - - - - Paul Koenig.
1st Assistant - - - - - S. E. Pougnet.
2nd „ - - - - - - F. Bijoux.

Reduit - - Overseer - - - W. A. Kennedy.
Forest Officer - - - - - F. Gleadow.

NEW ZEALAND.

Wellington.—Department of Agriculture :—

Biologist - - - - T. W. Kirk.

State Forest Department :—

Chief Forester - - - Henry John Matthews.

Colonial Botanic Garden :—

Head Gardener - - - ——

Dunedin - - Superintendent - - *D. Tannock.

Napier - - „ - - - W. Barton.

Invercargill - Head Gardener - - ——

Auckland - Ranger - - - William Goldie.

Christchurch - Head Gardener - - *Ambrose Taylor.

SEYCHELLES.

Botanic Station :—

Curator - - - - - - R. Dupont.

STRAITS SETTLEMENTS.

Straits Settlements.—Botanic Gardens :—

Singapore - Director - - - †H. N. Ridley, M.A., F.R.S., F.L.S.

Assistant Superintendent. *R. Derry.

Penang - - Superintendent - - *Walter Fox.

Federated Malay States.—Forest Department :—

	Conservator - -	A. M. Burn-Murdoch.

Kuala Lumpur.—Agricultural Department :—

	Director of Agriculture.	J. B. Carruthers, F.L.S.
	Mycologist - -	†W. J. Gallagher.

Experimental Plantations :—

	Superintendent -	*T. W. Main.

Perak (Taiping).—Government Gardens and Plantations :—

	Superintendent - -	*J. W. Campbell.

WEST INDIES.

Imperial Department of Agriculture :—

Barbados - -	Commissioner - -	Francis Watts, C.M.G., D.Sc., F.I.C., F.C.S.
	Scientific Assistant -	Walter Biffen, B.Sc.
	Mycologist and Agricultural Lecturer.	†F. A. Stockdale, B.A., F.L.S.

Antigua.—Botanic Station :—

	Curator - - -	*T. Jackson.
	Agricultural Assistant	J. H. Roden.

Barbados.—Botanic Station :—

	Superintendent -	John R. Bovell, I.S.O., F.L.S., F.C.S.
	Agricultural Assistant	J. S. Dash.

Dominica.—Botanic Station :—

	Curator - -	*Joseph Jones.

Agricultural School :—

	Officer in Charge -	*Archibald Brooks.

Grenada.—Botanic Garden :—

	Agricultural Superintendent.	R. D. Anstead, B.A.
	Agricultural Instructor	G. F. Branch.

Montserrat.—Botanic Station :—

	Curator - - -	*W. Robson.

St. Kitts-Nevis.—Botanic Station :—

	Agricultural Superintendent.	F. R. Shepherd.
	Agricultural Instructor	J. O. Maloney.

St. Lucia.—Botanic Station :—

	Agricultural Superintendent.	*John Chisnall Moore.
	Agricultural Instructor	T. B. Worm.

St. Vincent.—Botanic Station :—

	Curator	*W. N. Sands.
	Agricultural School :—	
	Officer in Charge	*W. H. Patterson.

Virgin Islands.—

	Agricultural Instructor.	*W. C. Fishlock.

Bahamas.—Botanic Station :—

	Curator	W. M. Cunningham.

British Guiana.—Botanic Gardens :—

Georgetown	Superintendent	A. W. Bartlett, B.A., B.Sc., F.L.S.
	Head Gardener	†John F. Waby, F.L.S.
	Assistant Gardener	——
	Agricultural Assistant	*Robert Ward.
Berbice	Keeper	J. Nardamoonie.

Jamaica.—Department of Agriculture :—

	Director	H. H. Cousins, M.A., F.C.S.
	Travelling Instructor	*William Cradwick.
	„ „	James Briscoe.
Hope Gardens and Experiment Station, Hill Gardens, and Castleton Gardens.	Superintendent	*William Harris, F.L.S.
Castleton Gardens	Assistant Superintendent.	John Campbell.
Kingston Parade Garden.	Superintendent	James Briscoe.
King's House Garden.	„	*William J. Thompson.

Tobago.—Botanic Station :—

	Curator	*Henry Millen.
	Agricultural Instructor	N. Lord.

Trinidad.—Botanic and Agricultural Department :—

Superintendent -	——
Assistant Superintendent.	*F. Evans.
Agricultural Instructor.	——
„ „	H. A. Nurse.
Curator, Government House Gardens.	——
Forest Officer - - - - -	C. S. Rogers.

INDIA.

Botanical Survey of India :—

Director - - - - -	Capt. A. T. Gage, I.M.S., M.A., M.B., B.Sc., F.L.S.

Officers associated with Survey :—

Capt. A. T. Gage, I.M.S., M.A., M.B., B.Sc., F.L.S.	Superintendent, Royal Botanic Garden, Calcutta.
†W. Burns, B.Sc. - - - -	Economic Botanist, Bombay.
†C. A. Barber, M.A., F.L.S. - -	Government Botanist, Madras.
†H. M. Leake, M.A., F.L.S. - -	Economic Botanist, United Provinces.

Departments of Agriculture, Botanical Officers attached to :—

Imperial Agricultural Research Institute, Pusa, Bengal :—

Mycologist - - - -	†E. J. Butler, M.B., F.L.S.
Supernumerary Mycologist -	†W. McRae, M.A., B.Sc.
Economic Botanist - -	A. Howard, M.A., F.L.S.
Supernumerary Botanist -	†E. Holmes Smith.

Bengal Agricultural Department, Calcutta :—

Economic Botanist - - -	E. J. Woodhouse, B.Sc.

Bombay Agricultural College, Poona :—

Economic Botanist - -	†W. Burns, B.Sc.

Central Provinces Agricultural Department, Nagpur :—

Economic Botanist - -	†R. J. D. Graham, M.A., B.Sc.

Departments of Agriculture, Botanical Officers attached to—*continued.*

Madras Agricultural Department :—

Government Botanist -	†C. A. Barber, M.A., F.L.S.

Punjab Agricultural Department, Lyallpur :—

Economic Botanist - -	†D. Milne, B.Sc.

Agricultural College, Cawnpur, United Provinces :—

Economic Botanist - -	†H. M. Leake, M.A., F.L.S.

Department of Economic Products :—

Reporter on Economic Products to the Government of India.	*I. H. Burkill, M.A., F.L.S., Superintendent, Industrial Section, Indian Museum, Calcutta.

BENGAL.

Calcutta.—Royal Botanic Garden, Sibpur :—

Superintendent - - - -	Capt. A. T. Gage, I.M.S., M.A., M.B., B.Sc., F.L.S.
Curator of Herbarium - - -	†W. W. Smith, M.A.
Curator of Garden - - -	*G. T. Lane.
Assistant Curator - - - -	*R. Badgery.
Probationer - - - - -	*F. H. Butcher.

Gardens in Culcutta :—

Assistant Curator - - - -	*J. T. Johnson.

Agri-Horticultural Society of India :—

Secretary - - - - -	F. Abbott.
Superintendent - - - -	*J. H. Stephen.

Darjeeling.—Lloyd Botanic Garden :—

Superintendent - - - -	Capt. A. T. Gage, I.M.S., M.A., M.B., B.Sc., F.L.S.
Curator - - - - - - -	*G. H. Cave.

Cinchona Department.—

Superintendent of Cinchona Cultivation and Government Quinologist.	Capt. A. T. Gage, I.M.S., M.A., M.B., B.Sc., F.L.S.

Cinchona Department—*continued.*

Mungpoo Plantation :—

Assistant Superintendent - -	*R. Pantling.
1st Assistant - - - - -	*W. A. Kennedy.
2nd „ - - - - -	*P. T. Russell.

Munsong Plantation :—

Assistant Superintendent - -	*J. Parkes.
1st Assistant - - - - -	*H. F. Green.

BOMBAY.

Bombay City.—Municipal Garden :—

Superintendent - - - -	C. D. Mahaluxmivala.

Ghorpuri.—Botanic Garden :—

Superintendent - - - -	P. G. Kanetkar.

Poona.—Government Gardens :—

Superintendent - - - -	*E. Little.

CENTRAL PROVINCES.

Nagpur.—Public Gardens :—

Superintendent - - - -	*J. E. Leslie.

MADRAS.

Madras City.—Agri-Horticultural Society :—

Hon. Secretary - - - -	L. E. Kirwan.
Superintendent - - - -	——

Ootacamund.—Government Gardens and Parks :—

Curator - - - - -	*R. L. Proudlock.

Cinchona Department.—

Director of Cinchona Plantations -	W. M. Standen.
Superintendent, Dodabetta Plantation.	H. V. Ryan.
Superintendent, Nedivattam and Hooker Plantations.	E. Collins.

PUNJAB.

Delhi.—Historic and other Gardens :—

Superintendent - - - -	*R. H. Locke.

Lahore.—Government Gardens :—
Superintendent - - - - *W. R. Mustoe.

Agri-Horticultural Gardens :—
Superintendent - - - - *W. R. Brown.

Simla.—Vice-regal Estate Gardens :—
Superintendent - - - - *Ernest Long.

UNITED PROVINCES OF AGRA AND OUDH.

Agra.—Taj and other Gardens :—
Superintendent - - - - *A. E. P. Griessen.

Allahabad.—Government Gardens :—
Superintendent - - - - *Norman Gill, F.L.S.

Cawnpur.—Memorial and other Gardens :—
Superintendent - - - - *E. G. Stroud.

Fyzabad.—Fyzabad Park and Gardens :—
Superintendent - - - - *A. E. Brown.

Lucknow.—Horticultural Gardens :—
Superintendent - - - - *H. J. Davies.
Probationer - - - - - *W. Head.

Saharanpur.—Government Botanic Gardens :—
Superintendent - - - - *A. C. Hartless.

NATIVE STATES.

Mysore (Bangalore):—
Superintendent - - - - *G. H. Krumbiegel.

Baroda :—
Superintendent - - - - *B. Cavanagh.

Travancore (Trivandrum):—
Director - - - - - Major F. W. Dawson.

Udaipur :—
Superintendent - - - - T. H. Storey.